THE JOURNAL OF THE
AMERICAN OSTEOPATHIC ASSOCIATION

VOL. X NEW YORK, N. Y., JUNE, 1911 No. 10

Relation of Spinal Lesions to Carbohydrate Metabolism*

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A Report on the Fourth Series of Mammalian Experiments, from the Physiological Laboratories of the American School of Osteopathy.

The original purpose of this series of experiments was to determine the relation of the spinal bony lesion to carbohydrate metabolism. Later, however, several other problems have arisen, such as the relation of these lesions to nutrition, normal functions of the stomach and intestines, gastro-intestinal infection, etc.; therefore some preliminary notes will be offered on these subjects in the summary of this article.

*EDITOR'S NOTE:—Dr. Deason feels his indebtedness, and wishes to express his appreciation, to the many students who helped in this work, both in caring for the dogs and in making the analyses; and to Dr. Henry, Professor of Chemistry and Clinical Diagnosis, for superintending the work in that line, and particularly to Mr. L. G. Robb, Assistant Instructor in Physiolgy, for his assistance in many ways.

It is evident that no one, unless situated as Dr. Deason has been, could have carried out this series of experiments. For instance one hundred and seventy-five dogs were used. The first cost of these, the cost of their care, of the rooms necessary, of the cages and of the constant attendance, to say nothing of the time which the experimenter himself gave would cost many hundreds of dollars. It has been learned from outside sources that Dr. Deason gave from two to twelve hours per day seven days in the week, for more than two years on this experimental work, and that Mr. Robb, his assistant, has given almost as much, not to speak of the hundreds of hours given by his student assisstants.

LITERATURE

In reviewing the literature of the exprimental work which has been done on the relation of the pancreas and other organs to carbohydrate metabolism, we find the following to report: It would seem that here as well as in most other functional disturbances that not only one, but in many cases, several structures are involved, and considering, as all physiological experimenters now well understand, the fact that many, or possibly all, organs of the body bear a certain essential functional relationship with each other, we can see how a disturbance of the function of one structure might easily affect the functional activity of another.

That either direct or indirect interference with the nerve supply to the pancreas and other related structures plays an important part in the production of glycosuria, we offer the following evidence from the literature:

Effects of total extirpation of the pancreas: Pflüger believes the fact that glycosuria which follows the extirpation of the salivary glands and the thyroid glands is generally attributed to the nervous phenomena would warrant a careful consideration of nervous elements in pancreatic glycosuria. After a consideration of the cases of partial extirpation of the pancreas cited in the

literature, Pflüger concludes that in these cases where glycosuria occurred the cause lay in the nervous disturbances. All, or practically all, of the investigators agree that after partial extirpation of the pancreas glycosuria is exceptional rather than general. Pflüger attributes the results of J. Thiraloix, who holds that there is invariably glycosuria resulting after partial extirpation, to poor technique in the removal of the pancreas and accompanying injury or violent stimulation of the nerves. Likewise, in H. Luthjes's experiments, Pflüger places the source of glycosuria in the white gangrene resulting from the cauterizing and which is undoubtedly a violent irritant to the nerves. Pflüger's own colleague, Wetzee, never found glycosuria to result after partial extirpation of the pancreas in dogs except in the case of one female which was suffering from acute peritonitis.

Pawlow has shown that the pancreas is innervated by the Vagus. E. Kulz claims that stimulation of the central end of the cut vagus leads to glycosuria. E. Cavazzani's work tends to show that stimulation of the celiac plexus causes sugar synthesis in the liver. The number of ways in which nerve stimulation may affect the metabolism of the carbohydrates is many. Claude Bernard maintains that the puncture of the floor of the fourth ventricle in the rabbit is followed by a transitory form of diabetes, the so-called Pique diabetes. This is known as the diabetic area. Pflüger says, "It is hardly to be doubted that there is a complicated nervous mechanism regulating the sugar metabolism much in the same way as the heart is regulated by a complex nervous system." Minkowski finds that in dogs and other mammals complete extirpation leads to the severest forms of diabetes mellitus. In other animals he found the same to be true which has been verified by nearly all workers on this problem.

Pflüger, in experimenting on frogs, produced diabetes after removal of the pancreas in all but one case. He says that failure to obtain glycosuria after total extirpation is due to the blood supply of the liver being very intimately connected with the pancreas and hence it is difficult to remove all without injuring the liver. If such a relation between the liver and the pancreas exists, and we find nothing in the literature which questions it, these two organs as well as the stomach and duodenum should bear a certain functional relationship with one another. Marius got diabetes in twelve frogs out of nineteen experimented upon. Gaupt also believes that the negative glycosuria in frogs upon removal of the pancreas, as reported by Minkwoski, is due to its intimate connection with the liver.

Pflüger, in one paper, advances the theory that two antagonistic powers regulate the sugar content of the urine. One is the function of the nervous system and has its center in the medulla. This power may cause a rise in the sugar content of the urine. The storing of glycogen in the liver depends partly upon this center. From all parts of the organism centripetal nerves pass to this center so as to regulate the needs of the organ. The other force is a chemical or anti-diabetic force of a substance secreted in the pancreas. By some unknown force it hinders the formation of sugar in the blood. Bernard and Eckhard have determined that the sugar center for metabolism lies in the medulla and works through the splanchnic area on the production of sugar from glycogen. As long as any part of the pancreas is alive it must have a central nervous connection by means of the fine net work of nerves along the blood vessels supplying blood to the pancreas.

There seems to be sufficient reason for accepting this nervous mechanism by way of the splanchnics, but whether they are secretory, trophic, regulatory,

or perform their function by regulating the blood supply has not been determined. Pflüger argues that the pancreas has a direct connection with the sugar center and consequently with the liver and duodenum. Evidently the glandular substance must play some important part in the sugar metabolism as diabetes results immediately on the removal of the last small part which previously had prevented the diabetes. In this way the excessive formation of sugar is counteracted by the action of the secretion of the pancreas to form an anti-diabetic ferment.

Partial extirpation, that is, from the head or tail of the gland, leaving from one-third to one-fifth of the organ gives the foregoing results, but the quantity of gland remaining is not as necessary as its state of nutrition, blood supply and innervation. Minkowski found glycosuria to be very slight in one case where he had left a part of the gland the size of a pea. In this case on feeding protein the sugar disappeared in the urine but reappeared on carbohydrate diet. Minkowski and Sandmeyer have observed cases of incomplete extirpation in which a slight glycosuria appeared which gradually reinforced itself and grew to a severe case of diabetes. This evolution comes about from a degeneration of the glandular elements after atrophy of the fragments of the gland remaining from the partial extirpation. According to Minkowski partial extirpation gives three results, viz.: First, absence of diabetes; second, diabetes of a light form; third, a light form of diabetes which gradually becomes severe. It would seem, and in fact, it is stated by some of the most experienced workers, that it is the interference with the blood and nerve supply and not the lack of glandular tissue which causes the glycosuria in partial extirpation.

Relation of Pancreas and Liver: According to Cheveau and Kaufman the pancreas is coupled with the liver in relation to glycogen formation. The formation of sugar from glycogen is increased after extirpation of the pancreas, and the amount of sugar used by the body remains the same. The sugar content of the blood is the same before or after the animals have been rendered diabetic. Section of the cord below the bulb whether alone or combined with extirpation of the pancreas causes diabetes, and, according to Cheveau and Kaufman, there are two centers in the bulb influencing the formation of sugar from glycogen. These two centers are acted on by the internal secretion of the pancreas in an opposite way. The inhibitory center is excited and the excitatory center is inhibited. The extirpation of the pancreas destroys the action of the inhibitory center and activates the excitatory center, thus causing the formation of sugar from the glycogen.

The internal secretion exercises a powerful retarding action on the disintegration of the tissues. Over production of sugar from the liver is the cause of pancreatic diabetes. First, from a disturbance of the nervous mechanism regulating the hepatic-glucose formation; second, by direct action on the liver, (suppression or a moderating action which produces the internal secretion of the pancreas which acts directly on the hepatic-glucose formation), and third, from histological disintegration, a larger amount of that material passes into circulation which is apt to form sugar in passing through the liver, i. e., a suppression of the moderating action of the pancreas on that substance.

Cutting the vagi and splanchnics has been found by Von Graefe and V. Henson to produce temporary glycosuria. The same kind of glycosuria is obtained by cutting the lower cervical ganglion. In four or five hours a maximum diabetes is reached. Traces may be found for even twenty-four hours. Eckhard obtained slight glycosuria upon cutting the upper chest ganglion of a sympa-

thetic nerve. Dr. Emil Canazzani has done some interesting experiments upon the celiac plexus. He stimulated the nerves to the liver, electrically, and obtained a decrease in the amount of glycogen in a few moments and an inverse in sugar content. Two dogs were experimented upon, the stimulation being kept up for from five to fifteen minutes. In the first dog the glycogen was 1.67%, and after stimulation was .77%. The other dog showed 3.94% before, and 2.30% after stimulation. How does this affect the formation of anti-bodies in the pancreas?

If the vagus is stimulated in the neck the stomach and oesophagus contract while the peristalsis of the intestine is apparently not affected, yet we know that the vagus exerts a power over the intestines. Many have stimulated and obtained no secretion of the pancreas or stomach, yet Pawlow has conclusively proven that. So far it has been contended that the plexus of the duodenum controls the secretion of anti-bodies in the pancreas.

Now it is to be proved that the duodenum does not have an internal secretion which helps to form the anti-bodies. Hedon grafted a piece of pancreas in a dog. This piece was connected with the peritoneum through nerves and blood vessels, then the entire pancreas was removed. Later the connection with the mesenteric nerves and blood vessels was cut and no diabetes resulted, hence the duodenum cannot form anti-bodies and does not influence the pancreas only when there is a nervous connection. This is of no immediate value to us in presenting the argument set forth in this article other than to show the nervous relationship existing between the duodenum and pancreas.

Transplantation: Hedon transplanted part of the pancreas under the skin and then removed the remaining pancreas. In this case no diabetes resulted, but when the grafted portion was removed diabetes immediately became evident and sugar was found in the urine. He says that few cases in which the above is not the result can be attributed to the outgrowth of the grafted pancreas upon the wall of the abdomen and the failure to remove this outgrowth. Sbolew, Minkowski, Thiraloix, Pflüger and others, by similar experiments have partially confirmed these results.

Feeding or injection of pancreatic extract: If the pancreas produces a substance which aids sugar metabolism it would seem possible and necessary in order to prove this secretion, to obtain from the extirpated pancreas a substance which upon injection into a diabetic animal would prevent the excretion of glucose in the urine. In 260 cases performed by Hedon there have been few results on injection of this pancreatic extract. Capparelli, however, with the same procedure, found that the sugar excretion was lessened in three hours and in most cases it completely disappeared. But Pflüger contends that in his experiments there seems to be some doubt as to whether he had removed all of the pancreas. Experiments by many prove that feeding the pancreas of cattle increases the sugar from three to four times the normal amount.

Other methods of causing glycosuria: Minkowski says that sugar elimination may be caused first by eating much sugar, (alimentary glycosuria), that is, flooding the organism with it; second, by rapid changing of glycogen into sugar by the liver causing an increase in the blood and consequently sugar in the urine, and third, by the administration of certain drugs. In pancreatic extirpation the oxidation of sugar is disturbed, while the drug causes sugar elimination without disturbing oxidation of the sugar. It causes the kidneys to take the sugar from the blood and secrete it thus causing the percentage

of sugar in the blood to fall below normal. It is thus shown that increased elimination of sugar in the urine can be caused in other ways than by disturbance of the function of the pancreas. It would seem from this that any interference with the innervation or nerve supply to the pancreas, liver or duodenum might effect at least a low percentage of glycosuria.

Proofs of internal secretion: As long as there is no other proof at hand than that which has been advanced so far, the theory of internal secretion must stand. Hedon has taken the sterilized extract of pancreas and injected it in large doses intraperitoneally and intravenously, without checking the diabetes. He found that the injection of water or glycerin extract of pancreas intraperitoneally always produced a large amount of pus even though the greatest care was exercised. If the extract was filtered through a medicated candle, hard knots appeared in place of the abscess and these were gradually absorbed. Hedon thinks the candle removes the protein and enzymes. After this filtration large amounts may be injected intravenously without killing the animal. Pflüger tries to disprove the theory of Minkowski, that pancreatotomy retains the toxins of the liver, by transfusion of blood from a diabetic animal to a healthy one without producing glycosuria in the healthy dog.

Chemical stimulation: Diabetes may be produced by chemical means. Certain substances, such as phloridzin and uranium salts are capable of producing a severe glycosuria which has been thought to be due to the detrimental action of these substances on the kidney cells. Coincident with this type of glycosuria there is a diminished sugar content in the blood. Various other substances such as carbon dioxide, adrenalin, ether, chloroform, morphine, curare, veratria, pyrogallol, salicylatis, pilocarpine, amyl-nitrate and potassium cyanide, possess the property of inducing glycosuria, and as far as has been investigated, according to Underhill, an accompanying hypoglycemia has been noted. Obviously, he says that this type conforms more closely to the true diabetes. Harter has shown that glycosuria is usually readily produced by painting the pancreas with piperidin or by intraperitoneal injection. At times this sugar elimination is very marked and may persist for several hours. Again the glycosuria is very slight or may be entirely lacking even though large doses of the drug have been given. Piperidin was selected by Harter as he thought it a typical representative of a number of drugs which produced glycosuria. In the case of piperidin glycosuria as studied by Harter, two attempts were made to determine whether it was accompanied by hyperglycemia. In neither of these experiments was the sugar content of the blood changed, and the suggestion was made that the renal factor is associated with this form of glycosuria. These experiments have been repeated by Underhill and the influence of piperidin applied to the pancreas with the following results: In three experiments by painting the pancreas with 5 c. c. of 4% piperidin he got only an average increase of .07% of sugar in the blood. This appears contrary to Harter's results mentioned above, but not so much of an increase when we recall that probably .04% of this amount obtained might have been due only to the anesthesia, leaving possibly .03% actually produced by the painting of the piperidin. These results also present variations of as much as .09%, and no two of them check closer than .03% so that the inaccuracy of such results is plainly evident. In reviewing the tables of experiments performed by Underhill, Scott and others, we find that in many cases the glycosuria is lacking. This may be explained by the fact that small or insufficient doses of

the drug were given, and hence the increase in sugar content of the blood was not sufficient to cause elimination by the kidneys. Hedon, Gley and Thiraloix have caused a profound degeneration and atrophy of the pancreas by injection of various substances without causing a trace of diabetes. Advocates of the internal secretion theory maintain that under the foregoing conditions small portions of the pancreas probably escaped degeneration. On the other hand adherents to the nervous theory fail to conceive how microscopic remnants could so thoroughly regulate sugar metabolism.

Relations of the Islets of Langerhans and the zymogenous tubules in the pancreas: After inanition, in some animals at least, it has been shown by Statkewitsch that there is a material increase in islet tissue. This statement has been confirmed by Vincent and Thompson, and also by Dale. There are rows of epithelial cells separated by very large expanded capillaries as in the thyroids. They thus present a very large surface to the blood stream. Between these rows of cells can be differentiated at times very fine granular substances which are afterwards extruded into the lumen.

From the above it will be seen that much work has been done in an attempt to determine the various causes of glycosuria and hyperglycemia. The results of these workers are so much at variance that it is indeed difficult to arrive at any definite conclusion. That the nervous system has at least a regulatory influence upon carbohydrate metabolism seems to be conclusively settled. That the blood supply to the pancreas also plays an important part seems quite probable in that it effects a greater or lesser functional activity by the quantity supplied, and by association of various organs through internal secretions. That the pancreas produces an internal secretion which is essential to carbohydrate metabolism has also been established.

RELATIONS OF THORACIC BONY LESIONS TO CARBOHYDRATE METABOLISM

It has been our purpose in this series of experiments to determine the relation of thoracic bony lesions on similar functions. Drs. McConnell and Farmer have done work on the relation of spinal lesions to functional disorders. They have found that spinal lesions in some cases, at least, are accompanied by glycosuria, but the greater part of their work has been along other lines. So far as we know, nothing has been done with this one purpose in view.

From the osteopathic texts we find the following: "I have found variations from the normal generally beginning with the ninth dorsal. I carefully examine and adjust every section of spine to the sacrum and coccyx, also the eleventh and twelfth ribs on both sides. These variations act powerfully on the excretory system and excite and irritate the solar plexus which gives off branches to the abdominal excretory system."—Page 401 Osteopathy-Research and Practice by Dr. A. T. Still. "Almost invariably there will be found a posterior dorso-lumbar curvature wherein the spinal column tissues are much contracted. This condition probably involves the sympathetics (vasco-motor and trophic), to the pancreas, liver and intestines."—Practice of Osteopathy, McConnell and Teall.

It would seem logical that if the bony lesion produces functional errors in the cord or splanchnic fibres, either or both, that these disturbances should interfere with the nervous mechanism which, as has been pointed out above, regulates certain functional activities governing carbohydrate metabolism, errors of which bring about certain functional disturbances such as glycosuria and hypoglycemia. That spinal bony lesions produce marked variations in blood pres-

sure has already been demonstrated in our mammalian experiments, Series No. 2, and described in a preliminary report on, "Some Physiological Effects of Vertebral Movements Experimentally Produced," published in the April, 1911, number of the *Journal of Osteopathy*.

The results of continued lesions on blood pressure have not as yet been determined by experiment, but judging from the results of the work that has been done, we find that lesion in, or pressure on, the middle dorsal produces an increase in blood pressure by vaso constriction. Now we know that overstimulation results finally in inhibition, which would mean vaso-dilation and an increase in blood supply to the parts innervated by the nerves from this region of the spine. This would mean a greater amount of blood than the veins could normally carry away, and therefore a congestion of the parts which in turn would mean a temporary increase, followed by a decrease, in function. We know that the functional activity of most secreting glands varies directly with their blood supply. The ability of the gland to produce internal secretion normal in quantity and quality should also be affected by any interference with its nerve or blood supply. Therefore, considering that the pancreas produces an internal secretion which performs an important function on carbohydrate metabolism, this would be materially affected by the spinal bony lesion if our reasoning is correct.

Experimental methods employed: Many things were to be considered in the study of functional effects. The normalization or the selection of normal animals is always first for obvious reasons. Dogs were the animals used because they may be more easily managed and will furnish sufficient urine for examination. Healthy dogs of medium age were used, as these are more likely to be normal. Each dog was kept from one to four weeks before being caged. It was usually necessary to feed the dogs regularly for a time to get them in good condition and accustomed to the new environment. If, after this preliminary test, the dogs seemed normal they were then placed in a cage and their physical condition was more carefully studied.

This cage, built of iron bars, was thirty inches wide, thirty high and eighty long. Each cage was divided into two compartments separated by a sheet iron partition and stood twelve inches from the floor. The floor of the cage consisted of heavy screen wire resting upon iron bars, which allowed the urine to pass through and be immediately separated from the feces or other material from the dog's body. Beneath the screen floor a zinc pan was suspended which served to collect the urine and drain it into another container. The door of the cage consisted of one entire end hinged in such a way that it might be removed. All parts of the cage were made so that they might be removed for cleaning and sterilizing. These cages were painted that they might be more easily cleaned and to prevent iron rust contamination in the feces and other material to be examined. The cages were washed clean with hot water and brush and sterilized with boiling water and steam twice daily. The containers used for collection of urine were cleaned and sterilized at the same time. Six such cages were used accommodating twelve animals at a time.

Care of the animals: After the animals selected had been kept long enough to determine that they were in good physical condition, they were given a soap bath in warm water and thorough scrubbing with a brush followed with a cold shower, and placed in the cages for normalization. Samples of urine were then taken twice daily and qualitative and quantitative analysis made.

Normalization of dogs: After being thoroughly washed, each dog was carefully weighed, (a special pair of scales being used which were sensitive to 25

(*Continued on page 497*)

The Osteopathic Lesion

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Part I.

The following study of the Osteopathic Lesion includes a brief survey of a series of experiments upon ten dogs. This is only a preliminary report, for there are many details to be completed. At a future time we expect to present a detail study of the nervous tissues of this and four other similar series. All of the material is in hand, but there is a considerable amount of work still to do. Lesions were produced after the same manner as stated in previous articles. And the same care and attention given the animal as stated heretofore. Likewise dissection, fixing fluids and stains were employed as previously noted.

Dog One. Lesion "twist" between fourth and fifth dorsals. Lesion presented rotation, tenderness, rigidity, muscular contraction, and fifth right rib upward at vertebral end. These remained for five days, or until animal was killed (anesthesia.)

Dissection revealed osseous misplacements as noted above. The contracted muscles relaxed, at death, with the exception of a deep fifth-layer muscle (multifidus spinae.) This muscle on right side, approximately one and a half inches long and an eighth in diameter, connecting the contiguous vertebrae from transverse to spinous processes, remained contractured. The muscle appeared slightly darker than its neighbors. A posterior spinal muscular branch (from fourth-fifth segment) was observed to enter this muscle. Most of the fibers of this nerve were found to be partially degenerated.

Complete dissection was made of cord, third to sixth inclusive, as well as all contiguous nerves including sympathetics, and these tissues reserved. Membranes of cord corresponding to right fourth-fifth dorsals slightly hemorrhagic; also, left posterior spinal nerve root. Cartilages of articular processes, intervertebral disc, and ligaments, together with stomach, liver, spleen, pancreas, and kidneys were reserved.

Microscopic findings: Contractured muscle showed interstitial myositis; articular surfaces, thickened; ligaments, thickened; intervertebral disc, normal. Nervous tissues, cord, posterior ganglia and sympathetics congested and beginning atrophy (detail report later.) Acute parenchymatous change in mucous coat of stomach (similar to cuts in previous articles.) Other organs normal with exception of spleen. This showed chronic fibrous involvement as well as an acute congestion. Probably the spleen was not involved by above lesion. Autopsy revealed a lesion between seventh-eighth vertebrae, approximation and very rigid, which was not produced by us. Possibly this was an etiologic factor. This lesion has not been studied in detail as yet. See cuts one and two.

Dog Two. Lesion right thirteenth rib subdislocated; vertebral end inward and downward; free end inward and upward.

Time from lesion production to autopsy eight days. Lesion very noticeable. Right thirteenth rib inward and beneath the twelfth. Some muscular contraction (after death) along lower and inner border of rib (quadratus lumborum.) Twelfth, thirteenth and fourteenth nervous segments removed for study.

Right kidney appeared congested (macroscopically.) Left appeared nor-

*Note. Parts first and second of this article are to a certain extent but a verification of previous work. But we have felt that a continued study of the same was justified owing to the significance of the subject. We hope to present in the near future some interesting results on the nerve paths affected by the osteopathic lesion.

mal. Analysis of urine prior to production of lesion negative. Analyses from third to eighth day succeeding lesion: Large amount of phosphates, considerable albumin, and moderate number of epithelial casts.

Microscopic findings: Muscle, myositis; nervous tissue, corresponding right posterior spinal ganglion markedly congested, and right sympathetic involved. Right kidney, moderate acute nephritis; left, slightly inflamed.

DOG THREE. Lesion between eleventh and twelfth dorsals (pronounced rotation.) Animal recovered nicely with apparently no general disorder for two days. Third day passed into a comatose state and died.

Dissection showed injury to anterior common ligament, that is, some laceration and hemorrhage. This was an unusual injury in our experience. The lesion was easily produced by traction and hyperextension followed by rotation (of course the point of lesion is always held firmly by second party.)

Nervous tissue examined showed moderate congestion. Unable to locate any visceral lesion. Cause of death unknown.

DOG FOUR. Died under anesthesia.

DOG FIVE. Lesion, rotation between tenth and eleventh dorsals by hyperextension.

The animal was under observation for twenty-five days. Following lesion stiffness of back was noted and there was some difficulty in walking. Appetite good and general condition fair.

Dissection revealed anterior tenth and eleventh dorsals with compensatory curvature of lower contiguous five vertebrae. The anterior lesion was very rigid. The rigidity was due to muscular contracture, ligamentous tenseness and a slight arthritis.

The urine remained negative.

Specimens: All nervous tissue, kidneys and digestive tract.

Microscopical findings: Very slight. Motor area of ninth-tenth segment slight beginning atrophy. All viscera negative.

The majority of lesions of tenth to twelfth dorsals cause disturbance of kidneys. In a few cases where there was more than average damage to the spinal muscles and ligaments visceral changes were not noted. Further observation is required to note the effect on viscera when these particular lesions become chronic.

DOG SIX. Lesion, "twist" between eleventh and twelfth dorsals.

Time under observation twenty-seven days. Lesion very rigid and tender. Urine showed a slight amount of albumin continuously from second day.

Dissection revealed rotation between eleventh and twelfth (marked); also, moderately anterior. Slight compensatory posterior curvature below.

Macroscopically nervous tissues (except sympathetics) appeared normal as well as the viscera.

Specimens were reserved of all nervous tissue, kidneys, stomach and intestines.

Microscopically spinal nervous ganglia slightly congested with beginning degeneration. But there was extensive congestion of sympathetics. Stomach and intestines, normal. Kidneys, moderate acute nephritis. See cuts (similar) of previous articles. See cut three (this article.)

DOG SEVEN. Lesion, rotation between fifth and sixth dorsals.

Time of observation, fifteen days. Dog appeared normal. On third day moderate amount of sugar appeared and continued in urine.

Autopsy: Slight rigidity of lesion; slight contracture of deep muscles. All nervous tissues and viscera appeared normal to naked eye.

Specimens: All nearby nervous tissues, pancreas, liver, stomach and kidneys.

Microscopic: Nervous tissue of fifth-sixth segment congested (several cell groups), posterior ganglia, and sympathetics (all nervous tissue in the various

experiments fixed and stained by several methods such as Marchi, Weigert-Pal, Williamson, Nissl, etc.; also several methods employed for viscera.) Kidneys, stomach and liver normal. Pancreas diseased, the islands of Langerhans affected. See cut four.

DOG EIGHT. Lesion pronounced rotation of ninth dorsal to right and eighth to left, and both anterior. This was a hard lesion to produce at first owing to incomplete relaxation.

Time of observation, nine days. Animal in good general health for four days, then slight loss in appetite for remaining period. Continuing from second day considerable sugar in urine.

Dissection showed above lesion and the vertebral end of ninth rib was downward and rigid.

Macroscopically, nervous tissues appeared normal with exception of slight hemorrhagic condition of spinal cord, eighth-ninth, and corresponding spinal ganglia. Internal organs apparently normal with exception of duodenum.

Specimens: Spinal cord, eighth-ninth segments and segments above and below; all corresponding intercostals and sympathetics and accompanying blood vessels; duodenum, liver, pancreas, stomach and kidneys.

Microscopically, stomach and kidneys normal. Duodenum and pancreas affected. No affection of liver or biliary and pancreatic ducts. Examination of nervous tissue not completed. See cuts five, six and seven.

DOG NINE. Twist between sixth and seventh dorsals; sixth to left and seventh to right. Pronounced contraction of deep muscles on left side of back immediately followed and remained until autopsy, seven days. Animal lost some weight and was not so active as time prior to lesion.

Autopsy revealed pronounced contraction of deep left muscles about the lesion. Stomach relaxed and atonic (slightly.) Left kidney displaced (floating.)

Specimens: All nervous tissues, contractured muscles and articular tissue of sixth-seventh dorsals; stomach, pancreas, both kidneys, their ligaments, vessels of hilum, and both suprarenals.

Microscopic findings: Congestion and beginning atrophy of several cell groups; stomach, beginning atony. Both kidneys normal, vessels entering hilum of floating kidney (left) slightly congested. Both suprarenals affected. See cuts eight and nine.

DOG TEN. Lesions were produced between third and fourth cervicals and between eighth and ninth dorsals.

Time of observation, seven days. The animal appeared somewhat "groggy" during this time. Appetite just fair. Lesions tender and rigid upon palpation, similar to other lesions.

Dissection revealed lesion as above. Both lesions very rigid, but muscles not much involved. The articular ligaments were very tense but articular surfaces apparently normal. Naked eye appearance of pancreas and liver apparently slightly congested. Heart tissue flabby.

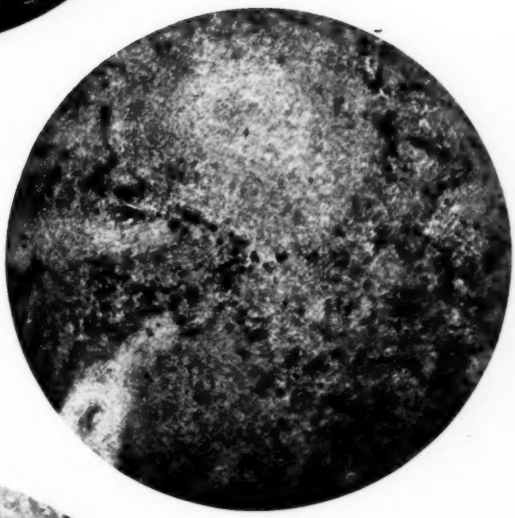
Specimens: All nervous, muscular and articular tissues of both lesions, pancreas, liver, stomach, kidneys, suprarenals, and heart muscle.

Microscopic findings: Slight involvement of spinal muscles, articular surfaces normal, articular ligaments thickened, nervous tissues, congested and atrophy (detail report of this and others later.) Stomach, kidneys and suprarenals, normal. Heart muscle, no report as yet. Liver, considerable congestion and slight degeneration of cells of middle lobe. Pancreas, interlobular congestion; islands of Langerhans, normal. Biliary and pancreatic ducts, normal. The blood vessels passing through the intervertebral formina of this case and dog eight were carefully examined and found normal. (Damage to capillaries and veins of nervous and visceral tissue—from dilatation—and endarteritis of small arteries are important lesions in most cases.) See cuts ten, eleven and twelve.

The following photomicrographs exemplify a study of several hundred sections of specimens (new) of the past year.

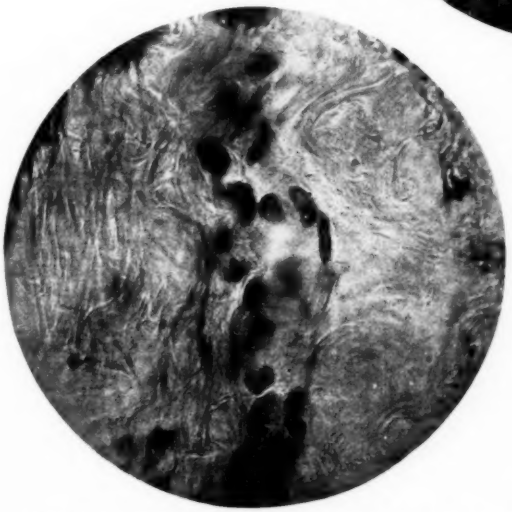
CUT ONE

A fibroid spleen. The capsule is thickened as shown in upper part of cut. From the capsule downward is seen a broad band of fibrous tissue. Meigs says this is a common lesion of chronic cases. X 120.



CUT TWO

From another portion of the spleen of Figure One. Showing a fibrous condition as seen in the two bands of the upper left portion. Lower portion exhibits an acute congestive state. X 120.

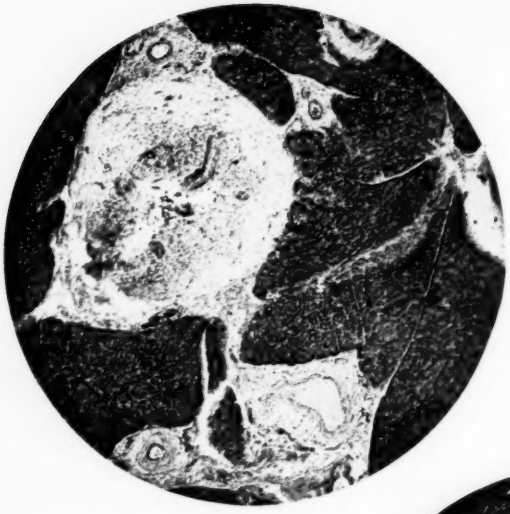


CUT THREE

Hemorrhage by diapedesis into a sympathetic ganglion. The large black spots are red blood corpuscles. The fine lines are sympathetic fibers, several of which are degenerated (Marchi.) This is a high magnification, 650 diameters and thus show the smallness of some of the axones. Of course many of these fibers are not myelinated. In our experience this is an important phase of the pathology following the osteopathic lesion.

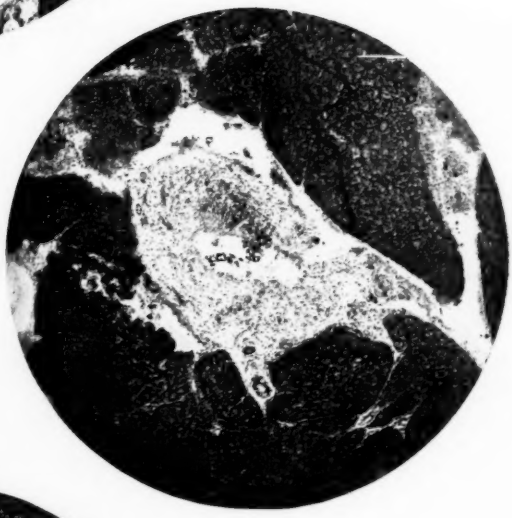
[The diameter of this cut was not reduced.]

PUBLISHERS NOTE:—In making the accompanying plates it was found necessary to reduce the diameter of the original photomicrograph 18%.



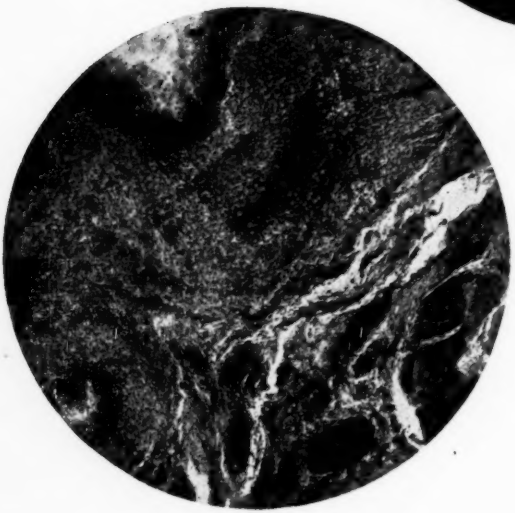
CUT FOUR

An island of Langerhans moderately degenerated (acute.) Aside from the degeneration, but unquestionably a contributing feature, is the arteritis (note lower left.) Opie (Diseases of the Pancreas) describes the atrophy of the island of Langerhans as the important pathologic factor of diabetes (the islands control carbo-hydrate metabolism.) X 65



CUT FIVE

Degeneration and atrophy of an island of Langerhans. The secreting parenchyma is affected, resulting in an acute interacinar pancreatitis. X 65.

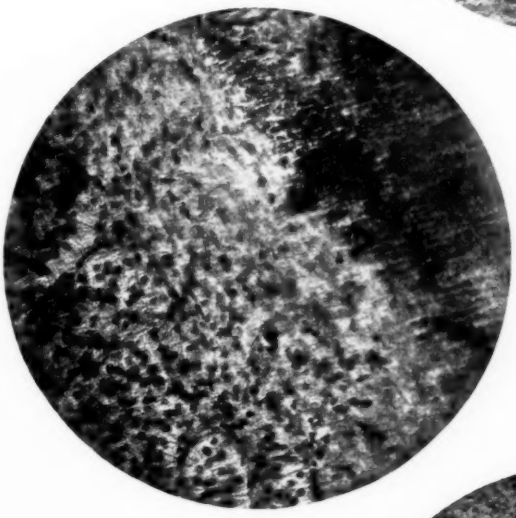


CUT SIX

Acute congestion of the submucous coat of the duodenum. X 65.

CUT SEVEN

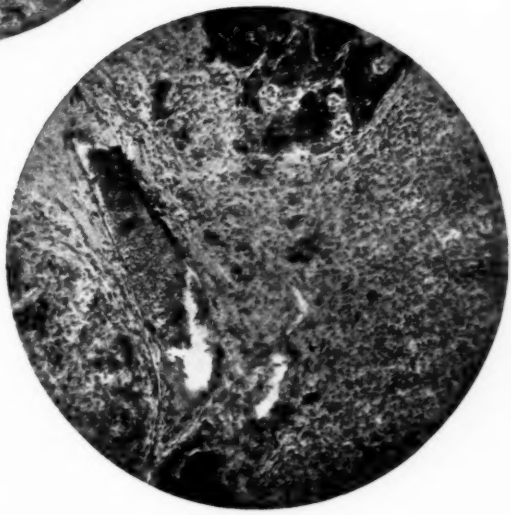
Acute inflammation of the mucous coat of the duodenum. X 65.



CUT EIGHT

Inflammation of the cortical substance of the suprarenal capsule. The dark area to the right is due to diapedesis, the middle light area shows cell atrophy. The blood vessels of the capsule (this section is near the capsule) showed considerable vascular disturbance. X 250.

Meigs (Origin of Disease) says: "surfaces of the organs and their envelopes are the most vulner- parts of them, and are more liable to discase than the deeper parts."



CUT NINE

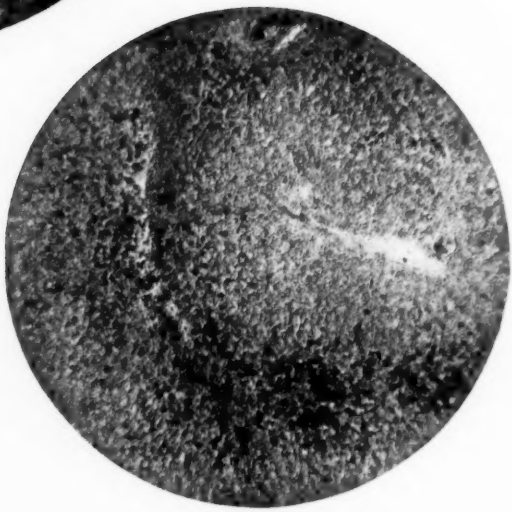
Section of the medullary portion of suprarenal. The suprarenal vein is seen to the middle left. There is some atrophy of the cells. X 120.

CUT TEN

Acute interlobular pancreatitis. Note the dilated vein and slight hemorrhage by diapedesis. X 120.

CUT ELEVEN

Interlobular pancreatitis with marked diapedesis. Beginning cell atrophy. X 250.



CUT TWELVE

Interlobular pancreatitis showing diapedesis from small vein and capillaries. X 90.

The Osteopathic Lesion

CARL P. McCONNELL, D. O., CHICAGO.

PART II.

UNITY OF THE BODY

We are prone to overlook the unity of the body. We disarticulate the mechanism at the expense of emphasizing its unity of structure. No doubt nerve roots present distinct functions but we should not err by thinking these functions are entirely independent. We are apt to humanize these functions. Comparative anatomy and embryology teach us it is the nervous system that unifies the parts. There has been a gradual separation or integration of the body unit with a corresponding co-ordination of its functions.

The innumerable afferent impulses, the continuous flow of sensory nervous force (not necessarily implying consciousness), the relation of receptor to effector, the so-termed nervous tension due to our external and internal environment is a fundamental essential to well being. This slight and imperceptible current of impulses, constantly present, is the source of tone.

Sensation induces motion and motion induces sensation,* both controlled by separate parts of the same nervous mechanism, but mutually dependent. And in health there is a constant sensory tone as well as muscle tone. Variation of environment necessarily produces a change of tonic stimulation. In just so far as the body mechanism responds and reacts to tonic stimulation through its integrals and their co-ordinating functions will the effects be stimulating or depressing. Important factors are the environmental changes, the *intactness* of the nervous mechanism, and the integrity of the nutritive supply. We will not go into details relative to the first. Nevertheless it covers a wide field from temperature changes, physical surroundings, sanitary conditions, dietetic habits, to mental attitudes and situations. Herein we are especially interested in the blockage of the afferent impulses following a certain condition that may arise, viz., structural perversion—the so-called osteopathic lesion.

It is evident from the teachings of physiology that any "structural perversion which by pressure produces or maintains functional disturbance"* must among its initiatory changes result in a cessation (partial at least) of the corresponding tension or tone. Consequently any physical lesion that lessens mobility, flexibility, elasticity of tissue, would be an osteopathic lesion. And in proportion to the extent of structural rigity, its locality and its length of maintenance will dependent conditions be manifested.**

Physiology also teaches that the integrity of the neurone is dependent upon at least two important conditions; first, its nutritive supply; and, second, nervous impulses. Lessen either the nutrition or the ever-constant nervous tension and a corresponding body change will be instituted. Immobilization of a spinal area, of muscular unbalance is just as much a lesion, although not necessarily a serious one, as a severe rotation between two vertebrae. This condition is an external environmental one and disturbs the nervous mechanism after the same manner (fundamentally) as an appendiceal lesion or an obstructed common bile duct. In each instance the effect is primarily an afferent one by way of the posterior spinal ganglion to

*Morat's Physiology of the Nervous System.

*Hulett's Principles of Osteopathy.

**"The nutrition of the nerve cell depends to some extent on its systematic activity. Disuse may lead to degeneration, and degeneration or interference with the functional activity of one system produces an effect on the functional activity of another."

the associated neurones of the reflex arc. The inception exemplifies an exaggerated physiologic state which, if the lesion is maintained, soon passes into a so-called pathologic condition.

It would not be physiologic to assume that the disturbance in its effect rested here. Neither is it necessary to step outside of physiologic teachings to assume that the above initiatory change is due to a partial closing of a spinal foramen with consequent pressure on an emerging axon,* or to assume some fanciful idea that the lesion is due to "pressure" on some "osteopathic center." If either of these conditions were present treatment of the condition would pass into the realm of operative surgery. Much of the misinterpretation arises here from our misunderstanding of fundamental anatomy and physiology (although even of this we know precious little.) We forget, for example, the ramifications of the primary sensory neurone and its extensive connections. It does not stop at the corresponding segment. Not only do many of the fibres extend upward into segments above in addition to the association neurones but others extend downward into lower segments.** Consequently, although we have so-called functional centers they are not entirely independent. We must ever keep in mind the concatenation not only of organ to organ through the several ferments, but nervously there is a constant interdependence which not only controls and regulates the separate tissues and organs but the mutual interrelation—the unity of the body—as well.

This view of the osteopathic lesion refers to the initiatory change only—the interference with afferent impulses. Something besides the immediately noticeable dependent motor change must take place, for the afferent impulses are essential to the nervous balance, equilibrium, of all the tissues, vaso-motor and secretory and viscero-motor, etc. Naturally, we think of the vaso-motors first because they control that other master tissue, the circulatory system. And without proper nutrition more than without sufficient impulses will the neurone become impaired. Again physiology teaches us that if the vaso-motor tone is impaired the vessel dilates, the blood stream is slowed, and the physiologic balance between the fluids of capillary and lymph space is disturbed.*

Although osteopathically the osteopathic lesion in its initiatory phase principally disturbs the well being of external environment, we should not overlook the physiologic importance of the internal environment as expressed through the nervous system. Either a vertebral lesion or an intestinal lesion will be manifested by reflex muscular contraction. In either instance a disturbance of afferent fibres initiates the effect upon the nervous tension or tone. Unquestionably, this teaches us that internal afferent tone, for example, the alimentary tract, is essential to health, the same different in degree as external afferent tone.

We commonly think of motor and sensory spinal cord centres as being separate and distinct; such is true to a limited extent only, for both are interdependent. Other so-called spinal cord centres are vaso-motor, viscero-motor, reflex and trophic. All are part and

*Research Institute Bulletin No. 1.

**"The articular surface of the bones are very richly supplied with sensory nerves. The axons of the sensory nerve cells, entering the spinal cord by its posterior roots, break into branches, a short one which descends to the first or second, rarely the third, segment below the point of entrance, and a long branch which descends by way of the posterior tracts to the medulla." "Collaterals from axons of sensory roots enter into relationship with the nerve cells of anterior horn. These collaterals together with some axons from cells of posterior horns carry impulses concerned in those reflexes which affect spinal and other skeletal muscles. Thus there is a path from articular surfaces to the spinal muscles that is involved by the bony lesion."—Louisa Burns, "The Bony Lesion a Cause of Disease." "Jour. of Osteo.," Nov. 1909.

*Research Institute Bulletin No. 1.

parcel of interdependent functions and all en masse are essential to the body unit.*

So in a strict sense there is no such thing as an independent organ, pictured from the viewpoint of an entity. The vaso-motors and viscero-motors and secretory fibres and trophic cells must under health conditions receive their full quota of nervous tension or impulses. The osteopathic lesion will disturb this balance, from all the evidence, just as quickly as the sensory or motor balance, but not being related to so-termed sense organs directly, we are less conscious of the disturbance. Consequently, in all and through all, sensory, motor, vaso-motor, viscero-motor, etc., must we look for the beginning pathology.

As has been intimated, nerve centres are partially grouped anatomically as well as functionally due to evolutionary changes, but each segment is only partially an anatomic and functional centre. The segments above and below enter anatomically, more or less, into direct relations whether we are considering spinal cord proper, posterior spinal ganglion or sympathetics. Herein is suggested to a certain extent the key to characteristic osteopathic technique. Our work is to adjust specific anatomic lesions, that is, lesions of gross structural perversions (mechanical), whereby nervous tension has been more or less partially blocked. The majority of these lesions in order so specially affect a certain organ will be found within a certain area because within certain segments (not commonly a single one) are grouped anatomically the various centres functionally related to the organ. This must not be interpreted too literally for it is all due to a more or less definite change, as heretofore stated, arising from evolutionary forces. Thus segments are partially independent but all overlapping most intrically and all grouped together most complexly to form a unit. Vaso-motor and viscero-motor centres so far as organic life is concerned give rise to the nervous centre idea owing to their great importance and to the definite change produced by way of the reflexes when corresponding segments, afferent fibres, are stimulated. True osteopathic technique is neither mechanical stimulation or inhibition of nervous tissue. Release the osteopathic lesion by adjustment and the quiet, permanent and imperceptible stimulation, nervous tension or balance, or tone, will be forthcoming—and this is osteopathy. Specific technique is specific adjustment, wherever indicated, nothing more or less; wherein the rigidity, the immobilization, the subluxation is reduced by mechanical means and nervous balance established. Indiscriminate "stimulation," "manipulation," and "general treatment" is almost certain to defeat specific purposes for in the first place it is not indicated and secondly reflexes normally intact are disturbed at the expense of the already labored reflexes of the lesion.*

A FEW GENERAL PRINCIPLES

Whatever the character of a nerve stimulus, there is always a chemical and physical change in the environment of the nerve cell. And this change or activity is propagated through the protoplasm of the neurone. Much, therefore, depends upon the integrity of all parts of the nervous element, its functional and structural relations, as well as the basic nutritive supply.

Although it is interesting to note that the neurone may function for a time without a cell body, just as soon as the nutrient of the protoplasm is utilized, function ceases and the nerve element dies. We must remember two fundamental facts that an intact nerve cell (structurally) and that both functioning receptive and excitatory cells are absolutely essential to the health of the organism. Associated with this are the facts that "structural-differentiation of the

*Hill, "The Body at Work."

*See Absams, "Spondylotherapy,,, p. 8.

cell is correlated with a functional polarity" and that the process which receives the impulse "corresponds in form and time of development of a cell of the usual form."

Another point we should keep clearly in mind is that a nerve element is not an entity. Within all probability every cell and group of cells are dependent to a greater or less extent upon the intactness of the body mechanism. A cell may be termed a structural and functional unit of any organ, but it is the organ or organism complex that is of special specific significance, although every part of the protoplasmic mass is an essential. But it is the functioning en masse that is of particular significance. Thus has arisen the partially true statement that a neurone is independent only from a trophic veiwpoint. Osteopathically (readjustment) we are daily taught by the clinical point of view that the various nervous mechanisms and systems and correlations are specific only within certain limitations; that afferent impulses are essential to functioning; that elasticity, flexibility, mobility, of the skeletal tissues means health, vitality, life; that afferent impulses are not necessarily all sensory ones; that readjustment, not mechanical stimulation and inhibition, is the one essential to osteopathic technique; and that technique is diametrically opposed to any routinism, but is specific mechanical adjustment of minutiae as well as of the grosser tissues.

To the physiologist and pathologist a knowledge of the functional systems is necessary for the various pathways of the nerve elements are shaped and decided both by the inheritance and experience of the individual. To the practicing osteopath all of this is of importance, but the one essential beyond others is to understand anatomical mechanics and architecture—to practice adjustment.

FUNCTIONAL DIVISIONS*

We know that all action externally or internally is the result directly or indirectly of stimuli, and that given certain stimuli distinct and characteristic response will follow. This is true of all nervous activity whether the change relates to the external world or has to do with internal nutritive processes.

Consequently we consider, morphologically, for convenience somatic and visceral divisions, the former dealing with the external surroundings and is divided into afferent and efferent divisions, the latter being concerned largely with the viscera is also divided into afferent and efferent divisions.

These divisions, somatic afferent and efferent, visceral afferent and efferent, are fundamental both structurally and functionally, and with exceptions the four kinds of activities, "the reception of somatic stimuli; the direction of somatic movements; the reception of visceral stimuli; the direction of visceral activities," "are called for in all segments of the body, and consequently each of the functional divisions is represented in each segment of the body, and all the segments of a given division are serially homologous with one another." This is of special interest to the osteopathist when considering the importance and significance of the osteopathic lesion to visceral disorder. We know that vaso-motor control, visceral muscular tone and secretory activities constitute an important part of visceral integrity. To what extent the somatic stimuli are contributing factors to these visceral activities and consequently nutrition is of great significance in discussing the relative import of the osteopathic lesion as an etiologic factor.

Somatic Afferent. We will sketch a few points bearing upon the several functional divisions. The first division, the somatic afferent, reference to the cutaneous nerves will answer our purpose. These form a large part of the

*The data in this and the succeeding section have been largely taken from Johnston's "Nervous System of Vertebrates."

dorsal spinal nerves of the trunk, the section of the body we have experimented with. However, the same principles will be applicable elsewhere as here. These fibers have their ganglion cell in the spinal ganglia. The distal end is found between the cells of the epidermis and consist of free branches. From the ganglion cells the central fibers pass into the dorsal part of the cord and bifurcate. One branch, the longer, extends upward and the other downward, ending finally in the dorsal horn; these fibers form the dorsal tracts. Each branch gives off collateral branches, some to one side of the cord, others to the opposite side, while still others pass to the ventral horn and to other areas. Thus it is readily seen there is a basis for a great variety of reflexes, the simplest being with collaterals to the ventral horn.

Visceral Afferent. The visceral afferent division is much smaller than the cutaneous afferent system. These are the fibers that bring impulses from the viscera to the spinal cord and brain. Johnston says, "They are distributed to the mucous surface in much the same way as the general cutaneous fibers of the skin. In the absence of special knowledge as to their appropriate stimuli it may be supposed that the fiber endings are stimulated by pressure as are the general cutaneous endings. Although it would be confusing to apply the term tactile to visceral impulses, it is probable that there is a close analogy between the two. The difference between cutaneous and visceral sensory apparatus is not in the form of the endings or the mode of stimulation, but in the connections of the two kinds of fibers in the central nervous system." The above is of more than ordinary osteopathic interest. If the osteopathic lesion ranks a very important etiologic factor, as we think it does, the relation and connection of the various functional nervous divisions both as to impulses and nutritive supply is of primary and fundamental consideration.

These visceral afferent fibers form a constituent part of the trunk dorsal nerves, their ganglion cells being in the same ganglia, the posterior spinal ganglia. The white rami conduct the fibers to a sympathetic ganglion and then by way of the sympathetics to the viscus. Clarke's column which is in a mesial position to the base of the dorsal horn contains the central endings in the cord. The neurites from these cells of this column constitute the direct cerebellar tract. Some of the fibers of the visceral afferent have other central connections but the bifurcation and tract formation is not so marked as in somatic afferents Of course an important relation here is that with the viscero-motor reflex.

Somatic Motor. These nerves arise from the cells of the ventral horn. They pass from the ventral surface of the cord and form the anterior fibers of the spinal nerve. The ventral nerve unites with the corresponding dorsal nerve near the distal end of the ganglion of the dorsal nerve and thus is formed the composite spinal nerve. Division of the spinal nerve into dorsal and ventral rami takes place. Near this point the ramus communicans passes to the sympathetic.

The central endings of the somatic nerves is in the latero-ventral area. The cells as well as the dendrites are large and the latter cover a large territory. A number of the neutrites pass through one or more segments before making their exit. Somatic motor fibers and their collaterals in the central nervous system are extensive, for bodily movements is an important function. Between the cutaneous surface and somatic motor nuclei there is a direct connection. The connection with these motor nuclei and visceral sensory is not supposed to be so direct, further investigation is required. But the motor neuron includes an important field for stim-

uli from many sources and bear direct or indirect relation to movements of the body.

Visceral Efferent. The visceral efferent fibers arise from nuclei in the lateral horn and pass out by way of the ventral roots through the white rami into the sympathetic ganglia. Probably visceral afferent collaterals directly connect with the visceral efferent nuclei. The correlation of the somatic and visceral functions is not understood. There are different tracts and different nerve centers.

The visceral efferents supply the smooth muscles and glands of the body by way of the sympathetics as well as the muscles of the heart and blood vessels.

The great osteopathic lesson to be learned from this brief resume of nervous anatomy is twofold: First, although to a certain extent, both structurally and functionally, the nervous system is partially separated into divisions there is an absolute dependency of one part to the other to stimuli. These impulses are part of the continuous life of the individual and each division is an absolute essential to every other division, both structurally and functionally. This is shown by both external and internal environment as well as by the morphological construction. Embryologically the sensory and motor fibers, the glia, the neuroglia, the sheath of Schwann as well as the different nuclei are all interdependent. Impair one portion even functionally and all of the others to a great or less extent, are impaired.

Secondly, nutritively there is even a greater significance to the point that one part is dependent upon others. Although trophically the neurone is termed an independent structure, still this is a fact only when nutrition is intact and impulses are normal. One of the most important facts of anatomy is to note the grouping of nuclei and the forming of ganglia and to study how absolutely dependent their integrity is to intact circulatory environment. Their circulatory dependency can not be subdivided into parts, more or less independent, as their functions are divided, for a group or ganglion may as a whole be to a greater or less extent impaired by the disturbance of a single vessel. This is a point, we believe, that can not be too greatly emphasized, for its bearing upon osteopathic technique is most significant.

THE SYMPATHETIC SYSYTEM

Embryologically the sympathetics system has the same origin as the cerebro-spinal system, which explains the intimate functional and pathological relation between the two systems.

Its development, however, is later than the cerebro-spinal system. It is an "outgrowth of fibers from the ventral root and also from the dorsal ganglion, in the direction of the aorta." This continued outgrowth of cells retains its connections until finally corresponding to each segment a pair of ganglia is formed. These are the ganglia of the chain and their connections are the rami communicantes. Later the ganglia are connected longitudinally; also additional ganglia are formed. Thus are formed the prevertebral ganglia, and still a little later the cell migration forms the peripheral ganglia such as the ganglia of the heart and digestive canal. While the above is taking place some of the cells of the ganglia of the chain and probably of other ganglia "send fibers back along the rami communicantes into the spinal ganglia or the rami of the spinal nerves." These fibers are called the gray ramus communicans. The fibers which grow out from the spinal nerves in time become myelinated and consequently are called white rami communicantes.

Thus the important feature to be noted here is that there is an intimate anatomical connection between the ventral root and dorsal root ganglion outward to the ganglia of the chain, the prevertebral ganglia, such as the cardiac, solar

and hypogastric plexuses, and the peripheral ganglia, such as the small ganglia of the heart and Auerbach and Meissner plexuses; and then connection back again to the spinal ganglia or the rami of the spinal nerves by way of the gray rami.

Osteopathically this anatomical relationship is of the greatest significance. It enters into the every day consideration of the practitioner. Experimentally we have found, that all the ganglia, including those of the cord to chain ganglia, are subject to pathologic changes due to the osteopathic lesion.*

Reference to a few more anatomical relations will probably help to elucidate this problem, although a few of the nervous connections were mentioned in the previous section.

The visceral sensory fibers have their ganglion cells in the spinal ganglia. These "are the largest of the myelinated fibers running in the sympathetic nerves and may be seen to pass through one or more of the sympathetic ganglia without forming any connection with the sympathetic cells." The distribution of the nerves is the mucosa of the viscera. The central ending is in the visceral sensory column of the cord. Thus it is seen these fibers are not really a part of the sympathetic owing to their not being anatomically connected. This fact can not have other than an important consideration in explaining physiologically the relation of the osteopathic lesion to visceral disturbances. It is claimed these fibers "are older than the sympathetic system and that the sympathetic ganglia are placed along the course of these primitive visceral sensory fibers."

Then there are small myelinated efferent fibers from the cells of the spinal cord that pass out by way of the ventral roots. They enter the ganglia of the chain and end in the first ganglion, or pass through it to another ganglion, or end in a prevertebral ganglion, or a peripheral ganglion. When passing through one ganglion to another they may give off collaterals. These fibers end by piercing the capsule of the sympathetic cells, ganglia of the chain, prevertebral and peripheral, and form pericellular baskets; so that "impulses sent out from the central nervous system are transferred to the sympathetic excitatory cells." Thus, probably, "the great majority if not all of the excitatory cells of the sympathetic are thus brought under the direct influence of the central nervous system." Consequently it is readily seen this type of nerve element of the sympathetic is also an important factor for osteopathic consideration.

Another type of nerve element that goes to make up the structure of the sympathetic system is sympathetic excitatory cells. Their structure has much in common with nervous tissue elsewhere. They may or may not become myelinated, but the fiber is very small. These are fibers that innervate all smooth muscle of the "alimentary canal, the ducts of glands, the urino-genital system, blood vessels, the skin or the eye."

The fourth type is the sympathetic sensory cells. These are found in the peripheral ganglia and have long dendrites that "are supposed to be distributed to mucosae and serve as sensory fibers." They give off branches where they pass through the sympathetic ganglia.

Enough anatomical data has been given to serve our purpose that "the afferent and efferent neurones whose cell-bodies lie respectively in the cranial or spinal ganglia and in the brain or cord belong properly to the cerebo-spinal system and not to the sympathetic," so that "in a strict sense the sympathetic consists solely of the neurones whose cell-bodies lie in the various ganglia, the excitatory and sensory sympathetic cells." Visceral activities is the cause of this off-shoot of the visceral affer-

*Morat speaking of the general laws of Waller says: "They may be verified in all nerves, in the tracts found in the spinal column and in the brain and the great sympathetic system." See section, this article, "Changes in Nervous Tissue."

ent and efferent divisions of the nervous system. The off-shoot is really an interpolation "in the efferent limb of the reflex chain of a peripheral neuron between the cerebro-spinal fiber and the organ innervated." There is comparatively little independence, peripheral reflexes, of the sympathetic system. "The great majority of its actions are directly aroused by efferent impulses coming from the brain or spinal cord and in response to the stimulation of visceral sensory fibers which run through, but have no connection with, the sympathetic ganglia." Hence an important part of the osteopathic lesion pathology must be based upon this last statement. This factor must lie within the findings, pathologically, of the cerebro-spinal ganglia. Anything that disturbs their impulses or nutrition must be basic.*

IMPORTANT VASCULAR CHANGES

Within all probability the chronicity of the pathology following the osteopathic lesion is dependent upon nutritive disturbance, first of the nerve cell, and secondly of the vascular tissues. To which extent the mere blockage of local afferent fibres would have in producing serious and long sustained functional disturbance and structural involvement would probably be debatable.** Consequently we are obliged to look for deeper and more significant factors. Although irritation or blockage or disuse of certain afferent fibers must have a deleterious effect upon its dependent reflex arcs, the remaining predominating tissue concerned with metabolic changes is the vascular system. And likewise with the vascular system as with the nervous system the problem must be approached from both the anatomic and physiologic sides.

The osteopathic lesion as an initiatory factor is an anatomic condition—a structural perversion—and no matter from just what points or physiologic phases the inception arises certain definite pathologic changes are noted as a consequence. Just what proportion of this inceptive role the disturbance of afferent impulses play further physiologic experimentation can alone determine. Consideration of the afferent vaso-motor reflex will probably throw considerable light on the problem. But mere anatomic perversion—subluxation, rigidity, etc.,—must by virtue of its disturbance of anatomic structures injure or damage or disturb circulatory integrity. And nervous tissue is very sensitive to circulatory changes. Mere compression of the abdominal aorta, for from fifteen to forty-five minutes will produce temporary paraplegia. If the compression is kept up for an hour or more permanent paraplegia is the result. The degeneration in these cases is confined to the gray matter and in its connecting tracts, while the spinal ganglion

*In this slight sketch we have said nothing about the bulbar autonomic system, the importance of the vagi and glosso-pharyngeals, stellate ganglion, etc., or the sacral autonomic system. Our purpose is to present an outline picture only, of the basic points of osteopathic pathology. We especially refer to Quain's Anatomy, Vol. III, eleventh edition, and Oppenheim's text book, Vol. II, fifth edition.

**Porter in Harvey Lectures, 1906-07, under "Vaso-motor Relations," says: "The maladjustment between afferent and efferent impulses is the source of many ills in our modern life." "The vaso-motor system seldom if ever dilates or constricts all the vessels at one time. The same afferent impulse will cause the vaso-motor centre to dilate the vessels of the face while it constricts those of the abdomen. The effect upon the general blood pressure depends upon the relative size of the dilating and constricting areas. Here the splanchnic nerves, which govern the vessels in the abdomen, have great importance." "The more the circulation is studied, the stronger is the conviction that it is not a fixed state, but a sensitive equilibrium, the result of the constantly varying action of a great number of factors." A great clinical fact is constantly presented to the practioner: there are comparatively few healthy individuals; and the diseased ones present an innumerable variety of osteopathic lesion which upon an adjustment with a regulation of habits works a wonderful change in the health of the individual. Vessel dilatation must play an important role. Vaso-motor spasm and paralysis induced by the osteopathic lesion is certain to lower resistance. Also read, Morat's "Physiology of the Nervous System," and Oppenheim's, "Nervous Diseases," Vol. I, p. 124.

and pyramidal tracts are not affected.

It is the vascular changes of a character approaching inflammatory phenomena—the dilated veins and capillaries,* the slowed blood stream, the endothelial compromise, the plasma leakage, leucocytal invasion, and diapedesis—that are of great significance, for when these changes occur in the nervous structures dependent nervous tissue must degenerate. Whether the vascular change is brought about by direct vascular pressure or disturbed afferent impulses by way of vaso-constrictors the significance of the pathology speaks for itself. (And it should always be remembered nerve tissue has a very rich blood supply.) If the vaso-motor centers are automatic only deep-seated structural perversion affecting the circulation of these centers alone would answer. Experiments show that the field of vascular circulation to the different segments is comparatively extensive and that within all probability the serious or predominating lesion is to the nutritive supply of the ganglia.**

The above phenomena that approach the pathology of inflammation is probably basic of many disease changes whether in nervous tissue or other tissue or viscus, for nervous and vascular structure are both predominating structures. Thus the osteopathic lesion may be both a predominating lesion (lowered resistance) or an active lesion. "Inflammation is the process by means of which cells and serum accumulate about an injurious substance and tend to remove or destroy it;"* but an injury may be mechanical, chemical, thermal, or bacterial. And the injury may show various nervous phenomena and be situated a long way from special influence of nervous centers. But we are of the opinion the above features are a basic outline explanatory of an important part of osteopathic pathology.

One point further. Although "inflammation is the reaction which follows an injury affecting the wall of blood vessels; increased permeability facilitates the escape of plasma and corpuscles into the surrounding tissue," bacterial infection is not the only cause for "an immense number of sterile substances, both fluid and solid, soluble and insoluble, organic and inorganic, incite a reaction which differs in no essential respect from that which follows the invasion of micro-organisms."** This would seem to teach us that a fundamental law of nervous physiology is that a nervous equilibrium represents a fluctuating vaso-motor balance dependent upon either or both afferent tone and nerve cell nutritive integrity. Muscular contracture, spinal rigidity, vertebral subluxations, displaced viscus, or a foreign body effect fundamentally nervous tissue and vascular structure after the same manner. Local congestion of any part of the body produces phenomena basically of the same character. But the locality of the lesion may be most significant, e. g., the spinal osteopathic lesion being contiguous and in fact not only environing but dynamically penetrating most important structures. Thus must not only engorgement, ischemia, altered blood states and various tissue changes play their role. Likewise ad-

*For an interesting discussion of vaso-motor relations, bearing upon this problem in a general way see W. T. Porter, Harvey Lecture, 1906; also, Am. Jour. Phys., Mch., 1911. And Oppenheim's Nervous Diseases, 5th edition.

**"The arteries in the brain and spinal cord are end-arteries; that is, are vessels whose branches do not anastomose with those of neighboring arteries, but break up into capillaries continued in the veins. There is no evidence that the arteries have vaso-motor nerves, and it appears that in the brain, at any rate, the cerebral circulation 'passively follows the changes in the general arterial and venous pressure'." Martin's General Path. See also Oppenheim.

*Opie-Harvey Lecture on Inflammation, Feb., 1910. See also Martin Gen. Path. Thoma, Gen. Path. The nervous system we have taken for granted may be disturbed by other causes than osteopathic, e. g., heredity, infection, auto-intoxication; but in these the osteopathic lesion is undoubtedly often a factor.

**Opie-Harvey Lecture, 1910.

hesions, contractures and various stages of chronicity play a subsidiary role to a vertebral lesion. The locality and character of the gross anatomic change to the finer and far-reaching histologic disturbances are innumerable.*

CHANGES IN NERVOUS TISSUE

Another year's study but further confirms our belief, as stated in a previous article,* that the most significant phase of osteopathic pathology is to be found in disturbed vascular supply to the nervous tissue. Judging by our experimental findings (microscopical), the nutritive changes in the ganglia must be paramount. Starting from the ever-constant fact that nervous tissue is unusually well supplied with nutritive vessels, any change in these vessels would seem significant. And these changes, dilatation, serum leakage, etc., have been repeatedly noted. The ganglia from cord to sympathetic are unquestionably affected.

The ecchymoses, diapedesis, cellular atrophy, neurone degeneration can have but one interpretation, especially when concomitant with, and anatomically related to, the perverted tissue (osteopathic lesion) and concurrent visceral functions are disturbed, that the osteopathic lesion is a vital part of etiology.

That restriction of a blood current to a part is of primary importance and particularly so when nervous tissue is concerned. Morat speaks of three orders of nervous degeneration, Wallerian, ascending, and atrophic. Osteopathically, we believe, it is the atrophic order of degeneration that invites special consideration; not necessarily "through prolonged default of functional activity," but through definite and active pathological changes dependent pathic treatment. It has given some the idea that to obtain certain results we must follow a prescribed movement upon vascular disturbance. This invites to a certain extent a new pathology, not that "a vascular dilatation followed by diapedesis and leucocytal invasion" is a newly discovered condition to an extensive pathology, but we believe this is a "new pathology" in so far that study of the osteopathic lesion has revealed.

That there is a certain basis for this pathology, other than osteopathic, medical literature shows. We would refer to Oppenheim Vol. I, pp. 109, 269, 395; Vol. II, pp. 1163, 1172. He also cites an interesting point, p. 1813, "It has been long since shown by clinical observations that a disturbance of vaso-motor innervation lead in the end to degenerative changes in the vessels walls." We prefer that the cuts as given in our previous articles be consulted. The nervous and visceral findings reveal an interesting basic pathology.*

OSTEOPATHIC CENTRES AND SPECIFIC TREATMENT

Probably considerable confusion and misunderstanding has arisen in our technique due to the association of the terms "osteopathic centres" and "specific treatment." Osteopathic centres has always been more or less a hazy term, based probably largely upon the location or rather aggregation of the so-called viscero-motor, secretory and subsidiary vaso-motor centres in the spinal cord, implying that by so-termed stimulation or inhibition or manipultaion of certain spinal areas definite effects upon the viscera will be forthcoming. This idea, we think, has led to a misinterpretation of the so-called specific osteo-

*But in all the maze of histologic, physiologic and pathologic data, we must not lose sight of fundamentals, for if the osteopathic lesion does not fill an important gap of etiology or phenomena basic to perverted physiology are not detected the osteopathic lesion is comparatively an insignificant factor.

*Research Bulletin No. 1. "The Osteopathic Lesion."

*For supplementary reading consult Bevan Lewis in Allbutt System of Med.; "Vaso-Motor Relations," Harvey Lectures 1906-07; Meigs, "Origin of Disease;" MacKenzie, "Symptoms and their Interpretation;" Research Bulletin No. 1.

An interesting series of articles by Solis-Cohen bearing on angioneurotic conditions will be found "N. Y. Med. Jour.," Feb. 19, 26 and Mch. 5, 1910. Angio paralysis and angio spasm are undoubtedly an important part of pathology.

or manipulation. Hence has followed with a number of osteopaths technique that is far from osteopathy and is nothing more or less than a "movement cure."

There is really no such thing as osteopathic centres any more than there are nervous centres. An interpretation of the latter term will clear up the former. Centres are nothing more or less than an association and collection of neurons into a partial system in order to carry out certain systematic functions.* Thus there is both an anatomical and functional relation and the aggregation of the grey matter is the greater when the demands are more complex or of a higher order. This co-ordination of functions really means functional or nervous centres, not trophic. Embryology teaches us there is a fusion of the segments of the grey axis giving origin to the functional association. But the segments are neither entirely independent morphologically or functionally. Even a slight acquaintance of the relation of embryology to the closely interrelated spinal cord and brain segments to the sympathetic shows this most clearly. And a study of the osteopathic lesion embryologically considered as well as a study of the experimental lesion still further accentuates this fact. Hence the basis of the nervous system being made up of an aggregation of units of more or less common and definite functions, but the functions of the several partial definite systems being gradated into others and all together comprising an independent whole.

So far as locality is concerned, treatment can be "specific" to a certain point only—in just so far as one of these functional units when disturbed by a certain lesion has its certain specific functions impaired, for on account of the dependency of these functional units one to the other the equilibrium of the entire system is disturbed. Now, owing to the probable general disturbance, to a greater or less extent, "specific" treatment does not necessarily imply the other extreme, a general body manipulation. This latter, alone, may defeat the entire purpose of the treatment; at any rate it precludes any definite osteopathic diagnosis.

Specific treatment means specific adjustment—this is fundamental to osteopathic technique. Without specific adjustment osteopathic etiology and pathology amounts to but little to the practitioner. Although the characterization and insignificance of osteopathy is based upon our interpretation of etiology, to the practitioner it amounts to but little if specific adjustment is not accomplished. Consequently specific treatment is not treatment of "osteopathic centres" whether by so-termed "stimulation," "inhibition," or "manipulation;" neither is it a "movement cure," "routinism" or "medical gymnastics." Specific treatment can mean nothing more nor less than specific readjustment of the osteopathic lesion;—and we know the osteopathic lesion is "any structural perversion which by pressure produces and maintains functional disturbances." Definite mechanical principles must be followed according to the individual case. This is characteristic treatment; and it requires most painstaking effort for every case presents new problems to solve.

All of this, however, does not preclude a certain amount of muscle relaxing or muscle toning or prescription of exercises or other hygienic measures. Lesions naturally vary in character and extent and present varying factors. From the very frequent vertebral rotation to the extended rigid area a great variety of structural perversions may be found. But it is the definite adjustment of part to part, and part to whole with a minimum of shock, and knowing when it is done, that characterizes the treatment.

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*Morat states, "The connexions which the different portions of the neuron gather together are centered in the nerve cell,, whence the name 'trophic centre' is given to the latter. In their turn the neurons associate and collect themselves together in more or less independent system, in 'functional centres' (or nervous, properly so-called)." See, also, Johnston, "Nervous System of Vertebrates."

A Hydatid Mole

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Some time ago a very rare and interesting neoplasm was placed in my hands for examination. The clinical aspect of the case, in brief outline is as follows:

The patient was a woman not far from forty years of age. She was without children, although a miscarriage was reported early in her married life. She was not conscious of having been pregnant after this, though the presence of this mole gave positive indication that she had been. She was of a nervous, billious temperament and was a student of far more than ordinary merit. She had been seriously sick for two months or more before the expulsion of this mole. The expulsion of the mole was sudden and wholly unexpected. It was accompanied by almost unedurable pain and violent hemorrhage. Her life was saved only after a severe struggle. Her convalescence after the expulsion of the mole was rapid and there seems to be no reason at the present time for doubting that the recovery is complete.

The growth unquestionably belongs to that class of neoplasms known as the Hydatid Mole, or Hydatidiform Mole. These growths are extremely rare and statistics show that when patients suffer from them, death is a very common result. It is probable that they always originate from an abortive pregnancy, but it is equally certain that a long period of time may elapse between the death and expulsion or absorption of the fetus and the development of the tumor.

The laboratory examination of the mass revealed a neoplasm weighing about two pounds and roughly appearing like a large mass of white grapes varying in size from millet seeds to small walnuts. The grape-like masses, when examined, were found to be cysts developed on the ends of the Chorionic villi. The fluid found inside of them was not quite so liquid as is the Amniotic fluid and was much less dense than Wharton's Jelly. In this particular case a chemical analysis showed the presence of about one-half of one per cent. of albumin and nearly two per cent. of sugar. Phosphates and chlorides were present in strong traces. The entire mass was rather larger than a quart cup.

As a general thing the hydatid mole develops early in pregnancy, seldom before the first month and usually not later than the fourth month. If it develops early the fetus almost invariably dies; if it develops later there is a possibility of the fetus's living to complete its development. As before stated, it seems certain that pregnancy is absolutely necessary for the formation of one of these strange growths, for in every case so far analyzed it appears that Chorionic villi constitute their foundation.

In all of the grape-like cysts which were subjected to a particularly careful examination, delicate connective tissue fibres were found in the vesicles, and in every case where a careful examination was made the vesicles had a well-defined epithelial covering. A number of cases have been recorded where the epithelial cells have destroyed the connective tissue of the uterine wall and have gotten into blood vessels and have thus been carried to other parts of the body where metastic growths have been developed. The arteries in many of the villi in this case were found to be partially degenerated. In some of the cases reported the growth is so closely united with the uterus that its total expulsion is almost impossible.

Hydatid moles are by no means easy of diagnosis. In a thin subject they may be palpated with some degree of

accuracy. Where this cannot be done, positive diagnosis may be impossible. If an unusually rapid enlargement of the uterus occurs in early pregnancy and this enlargement is accompanied by severe hemorrhage there may be reason to suspect a growth of this kind.

These moles are much more common in patients somewhat advanced in years than in young people. Patients who suffer from malignant growths upon some other part of the body are somewhat more likely to develop growths of this kind.

In the early stages of development the embryo becomes surrounded not only by the amnion, but by a membrane developed from the amnion which encloses the amnion itself and which is known as the chorion. The chorion consists of two distinct germinal layers, the outer layer being of Epiblastic origin and the inner layer being derived from the Somatopleuric layer of the Mesoblast. The outside Epiblastic layer soon divides into two reasonably well-defined layers, the outer one of which is known as the syncytium and the inner one, composed of large well-defined cells, known as the cells of Langhans. Cells of both of these layers push into the Decidua basalis in the form of solid cords. At a later time the Mesoblast which is rich in blood vessels, grows into these epithelial cords. When it is remembered that the blood vessels of the Mesoblast extend from the embryo it will readily be seen how it is that the embryo becomes connected with the Chorionic villi. This connection is precisely the same whether the villi undergo normal development or whether they become cystic. These membranes enclosing the fetus are themselves completely enclosed by the Decidua reflexa of the uterus. During the later stages of pregnancy the Decidua reflexa is normally absorbed but the Decidua basalis against which the fetus and its membranes are resting, develops into the maternal part of the placenta. These villi are at first formed over the entire surface of the Chorion and this appears to be the permanent condition in the horse and other closely-related animals, but in the human being these villi are of comparatively short duration except in one dish-shaped area which utimately develops into the placenta. Ordinarily these villi persist during the entire period of pregnancy and it is from the blood vessels of these villi that the fetus gets its nourishment. If for any reason the fetus perishes these villi, as a general thing, quickly lose their vitality and are either expelled or become absorbed, but it occasionally happens that the death of the fetus is not attended by the death of the Chorionic villi which may, when no longer controlled by the fetus, rush on into lawless and irregular development.

This development may assume any one of the several forms of which I now speak. The epithelial cells may rapidly multiply without attaining full development. When this occurs we have a primary uterine cancer. It is quite possible that many uterine cancers originate in this way. It may happen that the villi undergo cystic degeneration in which case we have such a growth as I have attempted to describe here. There is always a possibility of the epithelial cells on the outside of the cyst springing into unwonted activity. If the mole is not completely removed and these external epithelial cells proceed to rapid multiplication a cancer may follow a well-recognized cyst. Indeed, it is by no means rare for a Hydatid Mole to be followed by a cancer.

Another danger, against which the physician must be on his guard, is that of infection following the expulsion of the mole. The safety of the patient demands not only that the mole be removed in its entirety, but that every precaution be taken to prevent the entrance of bacteria into the uterus when the uterus is in such a poor condition to resist infection.

PACIFIC COLLEGE OF OSTEOPATHTY.

Arteriosclerosis

FRANK C. FARMER, D. O., CHICAGO.

The following article is the result of a review of the literature in an effort to secure some tangible clue to explain the clinical results attained osteopathically. After an extended search of the material obtainable one is struck with the resemblance to a religious discussion, to wit: We end where we started.

In a review of the literature accessible, I have selected those established facts, and the more authentic theories, apropos to arteriosclerosis, and have endeavored to correlate them to coincide with the clinical findings common to the practice of osteopathy. With such an initial conception I am aware that the deductions will be open to the accusation being biased;—in truth a refutation is welcomed, in the hope that such refutation might bring forth some light upon a dark subject. One fact I firmly believe, osteopathy does secure material benefit in diseases of the vascular system; but how, only a more extended study of the vaso-motor system will reveal.

Some of the important relevant factors, anatomically and physiologically, necessitate a recital to explain some of our deductions:

(a) The capacity of the vascular system is considerable more than the mass of blood therein. Excepting the pulmonary system the capacity of the veins is many times that of the arteries.

(b) The initial spread of the arterial bed is at the arteriole, thus insuring the same rate of blood flow throughout the arterial bed that obtains in the aorta.

(c) The elaboration of the vaso-motor system at the arteriole restricting the free flow of blood to the capillary in conjunction with the propelling force of the heart maintains the blood pressure.

THE BLOOD VESSELS

(I.) Blood vessels differ in structure, character and relative distribution of their component elements, depending upon their locality and function, an extended study of which, to my knowledge, no one has attempted.

(II.) Such differences in structure naturally raise the question as to the relative ability to maintain their integrity when subject to the natural strains of life.

(III.) Metamorphosis, progressive and retrogressive, is present from foetus to senility so that the classic picture of the vessels of the histology is seldom encountered in the autopsy room.

Structure of the Vessels.—Generally speaking the vessels consist of the three coats—adventitia, media and intima, the comparative distribution of which we can consider with benefit. The adventitia is made up of connective and white fibrous tissues with some yellow elastic tissue fibers extending to and dipping into the media. The media is made up of non-striated muscular, yellow elastic fibers and connective tissue. The intima consists of a single layer of endothelial cells.

Distribution of the Elements.—The connective tissue of the adventitia is continuous with that of the perivascular tissue, making difficult any classification as a coat per se. The relative thickness of the adventitia differs with the region of the body, the more protected arteries having less of the adventitious coat.

In the media the relative amount of muscular and yellow tissue differs with the distance from the heart. Proximity to the heart requires an increased amount of yellow elastic tissue to mitigate the systolic impulse, while the abundance of muscular tissue in the more distant

artery and arteriole suggests that they play a part in the futherance of the cardiac propulsion.

The intima extends the entire length of the vascular system with little change in so far as we know. Interposed between the intima and the media is the fenestrated membrane of Henle composed of three layers of yellow elastic and connective tissue. As the artery and arteriole decreases in size we find the disappearance of the adventitia, a lessening of the media in thickness, a disappearance of Henle's membrane until the single layer of endothelium of the capillary is reached.

Relative Function of the Different Structures of the Vessels.—The tissue elements of an artery are, therefore, as follows: Connective tissue, white fibrous tissue, yellow elastic tissue, non-striated muscle and endothelial cells. All tissues possess the elements of elasticity and extensibility, but in a different degree. A tissue to be elastic must resume the shape and consistency that it had prior to the subjection of the strain. An extensible tissue may distend before a force, the removal of which is not accompanied with the resumption of the tissue to its former size, shape and consistency. Wherever there is a distending force to which tissues of the body are subject, there one will find yellow elastic and muscular tissue. The non-viable is contracted in comparison to the viable artery, the caliber is reduced and the intima appears crumpled.

To explain this, Carpenter of London by a series of clever experiments has shown that in the moribund artery the yellow elastic tissue has resumed its natural shape and contour, thus rendering the arterial caliber smaller than the living artery. The comparative elasticity and extensibility of the various elements of the vascular wall are important.

A contracted muscle is less extensile but more elastic than yellow elastic tissue, while a non-contracted muscle is more extensile but less elastic than that tissue. Although the moribund artery is contracted and microscopical examination reveals all tissues excepting the yellow elastic in a crumpled state such does not obtain in the viable artery. Prof. MacWilliams of Aberdeen, observing that the walls of large arteries retained the ability to contract some hours subsequent to the patient's demise, carried out a series of experiments whereby he weighted the wall of the artery and found that with the added increment the artery elongated to a certain point at which sudden retraction ensued. His observations were that the point of retraction marked the overcoming of the muscular fiber and the assumption of the burden by the yellow elastic tissue. Experimenting upon the moribund artery, he found the converse was true, namely, the initial weight was upon the yellow elastic fiber and was accompanied with immediate retraction. In summing up his work Carpenter enumerates the tissues in the following order as receiving the brunt of the systolic pressure: Muscular, yellow elastic, white fibrous and adventitious connective tissue.

The intima is a passive tissue with the distending blood column upon the one side and the constricting vascular wall upon the other. From Carpenter's work it is quite probable that the initial and primary elasticity and contractility of the arterial wall falls upon the non-striated and contracted muscle of the media, the proper functioning of which is dependent upon the character and amount of its nourishment via the vasa-vasorum and the integrity of the vasomotor system. The factors affecting the elasticity are: Any interruption of the nutrition, or toxemic conditions as, syphilis, tuberculosis, etc., or an interruption of the integrity of the vasomotor nervous system. The arterial system is so complex, the opportunities for pathological invasion so etxended, each component so accessible to the

whole and vice versa, facilitating the spread of disease, that it does not seem possible to group all the pathology, to which the vessels are subject, under one head. Such classification is a work of the future.

As to general causes of arteriosclerosis up to this time Adami has given us the clearest explanation:

"More accurately there are two main causes of arteriosclerosis, either (1) increased strain thrown upon the arterial wall by heightened blood pressure, or (2) a weakened state of the wall, either from congenital causes or from diseases of the same. If the pressure be normal but the walls weakened the results are of the same order as when the pressure is heightened but the walls of normal resisting power. * * * It is not high pressure alone that causes arteriosclerosis: that condition may show itself without rise of blood pressure above the normal, but it is the ratio between the resisting powers of the vessel wall and the pressure to which they are subjected to from within. If this be accepted then, secondly, we are forced to realize that the arterial tree is by no means necessarily equally resistant in all its parts. In some individuals, whether from hereditary or acquired conditions, the aortic wall is relatively weak compared with the walls of the smaller vessels, in them the aorta may become affected when there is little or no change in the smaller arteries or arterioles. In others the aorta is resistant and the smaller vessels weak and apt to show the sclerotic change. In others the change is universal—although in these the series of alterations seen in the smaller vessels are from a histological point of view wholly different from those seen in the aorta."

(I wish to emphasize that this paper does not include that form of sclerosis resultant from toxemias, infections, or arteritis the result of extension from neighboring tissues. The etiology of such is apparent and fairly well understood.)

I have little patience with persons of one school appropriating the salient points of another school for the mere purpose of twisting such facts to meet the individual's case and needs. I hope I might be pardoned in the wish that Prof. Adami, with all his experience and ability, could investigate the influence spinal lesions have upon the class of "congenital" cases to which he refers in the above quotation. As we stated early in the paper, metamorphosis, retrogressive or progressive, is active from the foetus to senility, the point at which such processes become pathological cannot be determined at present. Neither is the site of the initial lesion to the vascular wall determined and is at present a pathological enigma. Moenckeberg has brilliantly described the sclerosis that bears his name, and this variety seems to be the type that is most frequently encountered in the cases which respond to our treatment.

Moenckeberg considers the initial lesion in this variety of sclerosis as an initial hypertrophy followed by a degeneration of the medial muscle, super-imposed upon which is a proliferation of the adventitial connective tissue and calcarious deposit to support the failing wall.

Meigs discusses the subject at length, in which he recognizes the fact that in the initial hypertrophy is the presence of new muscle cells as well as an increase of round cells, but sums up his observations with this statement: "As I have studied this so-called hypertrophy of the muscular tissue of the blood vessels, I have been irresistibly driven to the conclusion that the process is a degenerative one."

In a review of the points thus far, it is suggestive to note that from the experiments of Prof. MacWilliams the primary elastic fiber of the vessel wall to receive the impulse of the systole is the contracted muscular fiber; that Moenckeberg's pathological findings of the initial lesion is an hyperthrophy of the muscular tissues, followed by a reprogressive metamorphosis; with the subsequent observations of Meigs that it is degenerative from the inception; in connection with the knowledge that medial muscles are under the control of the vasomotor system.

VASO-MOTOR SYSTEM

With the consideration of the vaso-motor system we approach the connecting link between the osteopathic lesion and the resulting changes in the vascular wall. Ramifying in all directions, "supplying every vascular region" (Luciani), it is the one great mechanism that unifies the circulatory system. Because of its important control of the blood through the arteriole, the integrity of the vaso-motor nervous system is the slender barrier to instant death of the body from "bleeding into its veins."

Originating in the anterior roots of the dorsal tract of the cord the vaso-constrictor fibers emerge from the cord via the rami-communicantes to the sympathetic ganglia. In the ganglia branches extend both to the adjacent ganglia, superiorly and inferiorly, communicating with the other centers. From the ganglia the fibers may be included with a spinal nerve or pass along a vessel wall around which it forms a plexus. Enmeshed in this vascular plexus are peripheral ganglia, capable of executing, to a limited extent, the function of constriction independent of the central ganglia. Some of the more important tracts have been followed.

The constrictor fibers of the splanchnics run to the coeliac plexus and thence to the stomach, intestines and kidneys (Luciani.) Thence to the spleen, via the lesser splanchnics (asp) as well as the vagus (ochl.) Those of the arms emerge from the throacic cord—(third to seventh) join the sympathetic and unite at the first thoracic ganglion with the ramifications of the bronchial plexus (Cl Bernard.) From the roots of the eleventh, twelfth and thirteenth dorsal and the first and second lumbar nerves the vaso-constrictors of the lower limbs traverse via the rami-communicantes to the thoracic and abdominal sympathetic and then by way of the spinal nerves and large vessels to the vessels of the legs.

The investigations relative to the vaso-dilator fibers have not been as satisfactory as those of the constrictor, possibly because of the probability that the two fibers traverse one nerve fiber and the striking activity of the constrictors overshadows that of the dilators. The existence of the dilators as an entity has been thoroughly established, however. Midway between extreme constriction nad extreme dilation, the vaso-motor nerves maintain a rythmical oscillation which we call tone.

Numerous experiments could be cited to demonstrate the action of the peripheral ganglia of the vaso-constrictors, semi-independent of the central ganglia. Dastre and Morat performed an experiment upon the horse that is interesting in this connection—stimulating the cervical sympathetics they found the blood pressure in the facial artery rapidly arose, followed shortly by a depression more than if the nerve had been severed. This, they explained, was due to the fatigue of the peripheral ganglia, following excessive and prolonged stimulation. This point will be considered later in connection with the osteopathic pathology.

Remembering the origin and course of the vaso-motor tracts, and their relation to the bony structures, the question of osteopathic research thus intrudes itself.

OSTEOPATHIC PATHOLOGY

While by no means conclusive, the findings following the artificial production of the osteopathic spinal lesions are such as to suggest that a marked disturbance to the integrity of the vaso-motor centers and nerves is concomitant with the osteopathic lesion encountered clinically. In these experiments, the general picture was that of a hyperemic status of the spinal cord tissues, and extending to and involving the spinal and sympathetic ganglia. In addition to the hyperemia, specific incidents of congestion of the blood vessels, diaped-

esis, hemorrhagic foci, plasmic leakage and leucocytal invasion into the adjacent tissues were positive.

Especially true were the pathological contingencies apparent in and about the cells of the posterior and anterior horns, the anterior roots of the spinal nerves, the rami-communicantes, the sympathetic and the posterior ganglia. As a consequence of the vascular and nutritional disturbance, manifested by the vascular changes in and about the spinal cord, beginning degeneration of the nerve cells and fibers was noticeable. To what extent this degenerative phenomenon would progress was not determined because of the limited time existing between the production of the lesion and autopsy, but it is reasonable to suppose, that unless nature established some compensatory measures, there would be no progressive metamorphosis short of correction of the lesion.

Examination of the viscera, supplied by the nerves from the cord at the site of the artificial lesion, revealed a vascular phenomenon of a pathological nature. The vessels were engorged, cellular tissues invaded by exudates (plasma and leucocytes, etc.,) the similarity of the pathology suggesting the extension of the process from the central to the peripheral ganglia.

A brief summary of the more important factors of Moencheberg's sclerosis from an osteopathic viewpoint, would include: The primary elasticity of the arterial wall is due to the contracted muscles of the media; the functioning of those muscles depends upon the integrity of the vaso-motor nerves; the integrity of the vaso-motor nerves may be influenced by the osteopathic spinal lesion.

My attention was first attracted to the subject of arteriosclerosis by an occasional detection of an unequal hardening of the radial arteries through the daily use of a routine physical examination. Pursuing the study I observed that in many of these cases the blood pressure of the two arms differed by several degrees. A closer examination along the arterial trunks revealed an apparent difference in degree of sclerosis in the walls of the same vessel. In all cases of this type of which a record has been maintained, some decided osteopathic lesion apparently accounted for the unequal involvement of the vessels, and in several incidents the correction of the lesion has been followed by a retrogression of the sclerosis, a unifying of the several arteries, detected by palpation and the sphymomonometer.

Where the sclerosis has attacked the upper limbs, the most frequent lesions have been from the third to the fifth dorsal vertebrae, and as has been the case of an unequal blood pressure, the lesions were rotations of those vertebrae. In two incidents, bi-lateral sclerosis of the radials existed without apparent involvement of other palpable arteries. The lesion was of an impacted anterior nature extending from the second to fifth dorsal.

Cases exhibiting unequal tortuosity of the facial and temporal arteries, in my experience, have invariably shown lesions of the second, third and fourth cervical vertebrae and likewise, invariably these have been rotations toward the sclerosed side.

There is another type of sclerosis common to osteopathic practice, the etiology of which is apparently auto-intoxication, which will constitute a subsequent paper.

(CONCLUDED IN JULY ISSUE.)

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(*Continued from page 475.*)

Grams), and placed in a separate cage and left for from eight to twelve hours, after which time the nature and consistency of the feces were noted and the urine tested. The dog was fed and watered and given exercise by allowing it to run about on the campus, or when the weather was too bad, they were allowed to run free in the room. The cages were again cleaned and sterilized with boiling water and steam and the feet of the dogs washed before returning to the cage. Once or twice each week the dog received a soap scrubbing and shower bath. A regular mixed diet was given twice daily, the amount of food and water taken each day being noted. If the dog after being kept under such circumstances for a period of from two to four weeks showed no abnormal symptoms, and its urine was free from sugar, and was otherwise normal, and if the dog gradually increased or remained constant in weight (dogs will usually show a constant increase in weight when kept under such conditions), it was considered normal, and ready to be tested. Before lesioning, each animal was etherized usually two or three times to determine the effects of the anesthetic on the functional activities of the dog, and particularly its relation to production of sugar in the urine. (Many animals show a slight glycosuria, from .03% to .1% after administration of ether.) The animal was then left for a few days longer and, if no abnormal symptoms developed, was lesioned.

Methods of producing bony lesion: The dogs, after normalization, were placed under complete ether anesthesia which was maintained until the lesion was produced. Traction to the spine was first applied by pulling upon the caudal end while the anterior part of the body was held. After stretching, the lesion in the thoracic region (mid and lower dorsal), was produced by rotation with fixation, one individual holding the vertebra by pressure on its spinous or transverse process while another rotated the caudal end of the animal. As soon as a marked subluxation could be palpated the animal was released and placed in a normal position and the vertebrae again palpated. It is no easy task to produce a permanent bony lesion in a healthy dog, as they often adjust themselves while coming out of the anesthesia, or within a few hours after the operation. Often the same lesion must be produced from three to six times before it remains and in a few dogs we were never sure that we got a permanent bony lesion. This fact in itself, however, is no argument against the existence of the bony lesion in man, because of the anatomical differences between the dog's spine and the human. The dog's spine is so different in many respects that makes necessary a careful study of its particular anatomy before any tests may be successfully tried.

Care of dogs after lesioning: After lesioning, the animals were placed in their cages and watched until they had recovered from the anesthesia. The care after lesioning was the same as given above under "Normalization," except that they were not exercised for a day or two after the lesion was produced. This was done to prevent accidental correction of the lesion from vigorous exercise. Two rooms were used for the dogs both of which were supplied with steam heat which could be well regulated, hot and cold water and steam for sterilization and good ventiliation. The floors were scrubbed every day and everything kept in a sanitary condition to maintain good environmental conditions. One room was kept for the cages, the other for a "playroom" where the animals could take regular exercise. During spare time twenty students were kept busy for a period of thirteen months caring for these animals, analyzing the urine, etc.

Only two dogs were given to one student at a time. A daily record of the general condition of every animal was kept in a ledger as follows: Weight, diet, amount of food and drink, nature of feces, etc., to which was added the urinary findings.

Examination of Urine: The urine free from feces and other contamination was collected twice daily and kept in a cool place until ready for analysis. Each sample was then measured and placed in a clean breaker and the following tests made:

1. Any cloud present was tested for mucin, phosphates, urates, pus and bacteria.
2. The color was recorded according to Vogel's color scale.
3. The specific gravity was taken by means of a urinometer and test jar.
4. The amount of solids was estimated by use of Haesser's coefficient (2.33).
5. The chemical reaction was taken with litmus paper. When alkaline, the cause of the alkalinity was determined as due to fixed (sodium and potassium) or volatile (ammonia) alkalies.
6. The quantity stated is for each twenty-four hours unless otherwise specified.
7. The amount of urea was determined by means of a Hinds-Doremus ureaometer and a solution of sodium hypobromite. In some instances (animals Nos. 10 and 11) the determination was made by means of a Hüfner apparatus. The hypobromite solution used was prepared fresh each day.
8. Albumin tests were made by means of Heller's nitric acid test, the acetic acid and heat test. Any traces showing by these methods were confirmed by means of Esbach's solution. (Picric acid, 10 grams, citric acid, 20 grams and sufficient water to make 1,000 c. c.) Quantitative tests were also made by the Esbach twenty-four hour method.
9. In the estimation of chlorides a standard 12½% solution of silver nitrate was used.
10. Phosphates were determined by means of magnesium mixture;
11. Sugar tests were made by means of, first, Haines' or Fehling's solution, second, by Nylander's reagent, and third, by Benedict's reagent. Quantitative tests were made by first, Fehling's solution, and second, by Einhorn's saccharometer, (fermentation test.) In no case was sugar reported present unless confirmed by two or more reduction tests and a fermentation test. On dogs constantly showing sugar, acetone tests were made at various intervals by, first, Legal's test; second, Lieben's test (after distillation with phosphoric acid). All fermentation tests were controlled by means of a distilled water tube and a 1% glucose solution tube;
12. Indican tests were made by means of Obermeyer's reagent, (.2% Fe_2C_{16} in HC_1), and extraction by chloroform, the urine having been previously decolorized by lead acetate. Tests were cheked by the HNO_3 and HC_1 test;
13. Blood tests were made by means of old turpentine and tincture of guiacum (Haines' blood test);
14. Tests for uric acid and urates were made by:
    (a) The difference of solubility of urates in cold and warm solutions;
    (b) By means of the Murexide test.

All tests were checked by water controls and the beakers, glassware and apparatus were washed each time in hot

water, alcohol and ether and kept in a dust proof locker. Test tubes used for sugar tests were kept separate and cleaned in nitric acid to remove any percipitate of copper oxide and thus eliminate any fallacious reductions. The urinometers used for taking specific gravity were tested frequently with distilled water to establish their accuracy. All urine used in the various tests was carefully filtered, and in the sugar reduction tests any albumin present was removed by boiling and filtration. Dr. Henry, professor of Chemistry and Clinical Diagnosis, superintended this part of the work.

To insure that no personal factor might affect the results, those who analyzed the samples of urine were not allowed to know anything regarding the nature of the animals tested. They never knew whether the samples came from normal or lesioned animals and were seldom even allowed to enter the room in which the dogs were kept. More than two thousand complete qualitative and quantitative analyses were made according to the methods given above during the series.

Post mortem examination: After a permanent lesion had been produced, the dogs were kept from two weeks to seven months under the above-described condition. After a good record had been obtained, the dogs were killed by the use of chloroform and placed immediately upon the operating table, ventrum down. The skin was laid open the entire length of the spine and laid back. The superficial appearance of muscles and fascia was carefully inspected in the presence of other members of the faculty. The entire spine was then removed, the ribs being clipped off two or three inches from the spine which was then examined as to its general contour, curvatures, specific subluxation, etc. In some cases deep dissections were made, but usually it was placed immediately into fixing solution and given to a pathologist, together with specimens of the viscera for pathological examination. This part of the work has not as yet been completed, and therefore we cannot report on the findings at this time.

Results: We give here a brief history of every animal used lest we be accused of selecting special examples.

It has been suggested that such lesions as we claim to produce experimentally could either not be produced and made to remain as permanent subluxations, or they would be complete luxations in which case there would be trauma to the cord and the effects would be produced in this way. That permanent subluxations can be produced experimentally on animals has been conclusively proven by the work of Drs. McConnell and Farmer and verified by the results of this series of experiments. That these lesions were not luxations which could cause any trauma to the cord is evident from the many post mortem examinations which have been made by Drs. McConnell and Farmer and by the work reported in this article. That the subluxations which we have produced do not produce their effects by pressure or trauma to the cord is evidenced by the fact that none of our lesioned animals has ever developed the slighest paralysis or other symptoms of trauma to the cord.

Animal No. 1. This was a well nourished female about three years of age. The weight was about 15 kilograms. (In the beginning we had no balances for weighing, therefore no exact account of nutrition can be given.) There were no signs of recent pregnancy, and the spine was normal.

Normalization: With proper feeding and good care the animal increased in weight and improved in general nutrition. Appetite was good and feces normal.

Urinary findings: Showed an average of .028% sugar in urine for ten days and no sample went above .2%.

After lesion, rotation in lower dorsal: Twenty-four hours after lesion the urine showed .1% sugar, with a slight increase in specific gravity. On the second day the animal showed a presence of 2.78%. There was tenderness at that point of the spine where the lesion was produced, but no other symp-

toms except a slight diarrhoea on the second day after lesioning. No post mortem was made.

Animal No. 2. A female with no signs of pregnancy, about four years old. Weight, 11,300 grams, with excellent nutrition and general good health.

Normalization: This animal was kept for three weeks before being caged. While caged she showed only a very slight trace of sugar once in thirty-three days and no other abnormalities.

After lesion, rotation in lower dorsal: The following day the animal showed .1% of sugar in urine and for twenty-six days following the urine varied in its sugar content from a trace to .5%, showing an average of .11% during this time. The lesion was lost and reproduced. (During this time there was a gradual increase in weight up to 12,000 grms., showing no loss in nutrition.) There was an average increase in specific gravity from 1.030 to 1.039, and a decrease in amount voided. The daily voidance while normal was 224 c. c. and after lesion only 110. There was an increase in solids of .5 gms. per 100 c. c. but no other material changes. The animal now seemed to be recovering from the effects of the lesion, during the next twenty-two days there being only an occasional trace of sugar in the urine. The quantity was increased to an average of 120 c. c. for twenty-four hours. A slight increase in indican was evident. Specific gravity showed an average of 1.037, and the solids were increased 1 gm. per 100 c. c. above the normal. The weight of the animal remained about constant with daily variations. No decrease in nutrition or appetite, and no material changes in the consistency of the feces was observed. During the third month the sugar in the urine reappeared, varying from a trace to .5%. The specific gravity increased to an average of 1.042, and the weight of the animal remained constant. The solids constantly increased from 8 to 9 gms. per 100 c. c., indican increased, and quantity increased to an average of 155 c. c. daily. Urea was markedly decreased. The feces remained normal in consistency. From this date, February 26th, up to the present date, May 25th, the animal's urine continued to increase in sugar content, averaging from ¼ to 1% daily, specific gravity 1.038, and quantity 124 c. c., with an increase of urea and indican; the weight still remained about constant, and no abnormal consistency of feces. This animal has now shown functional disturbances for nearly seven months after the last lesion was produced. It is to be kept under observation for a few months longer.

Animal No. 3. After eighteen days of observation this animal failed to normalize. It was therefore discarded.

Animal No. 4. This was a female about eight years old, weighing 1003 gms. General condition and nutrition was fair.

Normalization: This dog showed only a slight increase in weight during normalization, but this may have been due to the age of the animal. The dog was normalized for thirty-two days, during which time on three different days traces of sugar were noted.

Urinary findings: Average specific gravity was 1.033, with an average voidance of 80 c. c. daily. Urea 1.5 gms. per 100 c. c.

After lesion, rotation in lower dorsal: This dog was observed twelve days after the lesion was produced. There was an occasional glycosuria amounting to ¼ of 1%. The specific gravity increased to 1.041. The quantity for twenty-four hours decreased from 80 to 52 c. c., daily average. The urea was increased to 3.3 grams per 100 c. c. On third day after lesioning, the animal became so ill that it had to be removed from the cage. The appetite was lost, and constipation developed, the feces being very hard and dry. The weight decreased to 8,040 gms., and the animal became very weak.

Post mortem: The lesion was found to be a rotation subluxation between the tenth and eleventh thoracics. The spine was kept for pathological examination. The extreme effects resulting in this instance might be attributed to the age of the dog. Young dogs are not so easily affected.

Animal No. 5. A female of about five years, weighing 13,000 gms., with general good health and nutrition.

Normalization: The animal was normalized for twenty-six days, during which time it showed a trace of sugar in the urine.

Urinary findings: Specific gravity was 1.034, and the quantity voided 139 c. c., with a presence of .5% urea.

After lesion, rotation in lower thoracic region: During the following fourteen days there was a slight increase in sugar in the urine. The specific gravity fell to 1.028, and the average daily quantity was 128 c. c., urea, 1.8%. There was a slight diarrhoea on the second day but no other symptoms. The lesion disappeared on the third day, and the dog was relesioned on the fourteenth day after the first with the following results: There was a slight increase in glycosuria, specific gravity being increased to 1.035, urea 3.7%. The quantity fell to 106 c. c. The dog escaped one week after the second lesion was produced and no further results were obtained.

Animal No. 6. A young bitch about two years old, and seemingly in perfect condition, but showed an almost constant glycosuria and other abnormal urinary contents for three months. The animal was never lesioned.

Animal No. 7. This was a male dog about two years old in perfect condition, nutrition, appetite, etc., being excellent.

Normalization: This animal was kept thirty days under optimum conditions, during which time there was only a slight trace of sugar in the urine.

Urinary findings: Specific gravity was 1.039, with an average voidance of 338 c. c. Urea, 87%. There was no abnormal findings. The feces were normal and the animal increased in weight from 16,000 gms. to 17,225 gms.

After lesion, in lower throacic region: The animal showed a glycosuria varying from a trace up to 5.%, showing an average of .2% for the first month, .3% for the second month, .2% during the third month, and .6% during the fourth month. The specific gravity for the first month after lesion was increased from 1.021 to 1.023, 1.024 for the second, 1.032 for the third, and 1.033 for the fourth month. The quantity was diminished from 338 c. c. daily normal to 228 c. c. for the first, 254 c. c. for the second, 225 c. c. for the third, and 223 c. c. for the fourth month after lesion. The urea showed an increase from .87% normal to 1.8%for the first, 1.6% for the second and 2.3% for the third month, with a decrease in the fourth, the average after lesion being 1.5 gms. per 100 c. c. The weight continued to increase for two months after the lesion was produced, reaching a maximum of 22,100 gms. The weight then began to decrease and at the end of the fourth month had fallen to 20,000 grams, with a marked change in general health and nutrition. The appetite was not as good as during the last month, but this might have been due to insufficient exercise. The feces were occasionally abnormal, but no marked diarrhoea or constipation occurred.

Post mortem: Dissection showed a lesion between the ninth and tenth thoracics and an approximation between the second and third lumbar segments. The lower dorsal region showed a scoliosis with convexity to the right. The spine was kept for pathological examination.

Animal No. 8. This dog was tested for twenty-one days, but could not be well normalized, and was therefore not used.

Animal No. 9. This was a female about five years old, weighing 11,400 grams, and seemingly normal in every way.

Normalization: This animal gradually increased in weight during the sixteen days of normalization; nutrition, appetite, feces and general condition normal.

Urinary findings: There was only a slight trace of sugar in the urine during normalization. The specific gravity was 1.036 with a daily voidance of 121 c. c., urea 1.1%.

After lesion, in the mid-dorsal: The animal gradually decreased in weight from 12,000 to 10,000 grams after two months. The dog's appetite increased some, and she was not as lively, but this of course might have been due to insufficient exercise. The dog also showed varying abnormalities in feces, sometimes hard and dry, at other times a slight diarrhoea appeared. No glycosuria except occasional traces appeared for thirty days after the lesion. From this time on for forty-seven days, there was a glycosuria varying on different days from a trace to .5%, an average of .33%. For three days following the lesion, the specific gravity was 1.039. Quantity increased to 135 c. c. daily, and urea 2.9%, or an increase of 1.8 grams per 100 c. c. The dog was then allowed to run free for thirty days, and again caged. After being caged it was kept for forty-seven days. The average specific gravity was 1.028, the quantity 150 c. c. daily and 2.9% of urea. There was very little variation except in the sugar content, but a marked increase in indican.

Post mortem: This dog was accidentally killed, and therefore no examination of the spine was made.

Animal No. 10. A female of about four years, weighing 12,000 grams. Physical condition and general health was good.

Normalization: The animal was normalized for twelve days during which time the weight gradually increased, nutrition, appetite and feces remaining normal.

Urinary findings: Showed a trace of sugar on one day only. Average specific gravity of the urine 1.025, quantity 331 c. c. and 3.6 grams of urea per 100 c. c.

After lesion, in the mid thoracic region: There was a decrease in weight from 12,000 to 11,000 grams. The nutrition was not good and appetite decreased, many days the dog refusing food. There was a constant diarrhoea for thirty-seven days, and a mucopurulent discharge from the vagina. Bacteriological examination showed a pyogenic infection. Urinary analyses showed a slight glycosuria varying from a trace up to ¼%. The specific gravity was 1.029 and the quantity reduced to an average of 150 c. c., with an increase in urea to 2.4 grams per 100 c. c. An increase in indican was noted. Dog now

began to improve, and we think the lesion had been accidentally corrected as it was no longer palpable. The dog was then allowed to renormalize for forty-two days, during which time the weight gradually increased to 16,700 grams. Nutrition and appetite were good. The feces were normal, and the discharge from the vagina had stopped, so that physically the animal was in perfect condition.

Urinary findings during the normalization: The sugar in the urine materially lessened. Specific gravity decreased to 1.027, but quantity increased to 370 c. c. daily voidance, the urea decreasing to .1 grams per 100 c. c. The indican was much reduced.

Results of the second lesion: The lesion was reproduced in the same region and manner as before, with the following results: There were no abnormal symptoms during the ten days following the lesion. The specific gravity was 1.031, quantity 336 c. c., and urea 2.5%, with no glycosuria. Upon palpation, no lesion could be found. We therefore decided there had been another accidental correction, so the animal was lesioned a third and a fourth time. No permanent subluxation could be produced. The dog remained in normal condition physically. There were no abnormal urinary findings except an occasional appearance of albumin and indican. The urine remained turbid for two months, but no glycosuria appeared.

Post mortem: A marked scoliosis was found in the lower thoracic region, but there were no specific subluxations.

Animal No. 11. A male about four years old, weighing 13,000 gms. and in good physical condition.

Normalization: The animal gradually increased to 13,500 gms. in fifteen days, during which time the nutrition, appetite and feces were normal.

Urinary findings: A trace of sugar appeared on the first day only. Specific gravity was 1.041 with an average daily quantity of 289 c. c. and 2.5 gms. urea.

Results of lesion, produced in lower dorsal: Animal continued to increase in weight during the following sixteen days. The appetite, diet and feces were normal with an exception of a slight diarrhoea on the third and fourth days following lesion. There was a slight glycosuria amounting to ¼ of 1%, but was not of constant occurrence. Specific gravity decreased to 1.035, the quantity decreased to 212 c. c. daily voidance while the urea was slightly increased. The animal was allowed to run free for twelve days that it might be under more natural environment. It did not seem to be as lively, but continued to increase in weight. It was then caged again and kept for fifty days. During this time the weight increased, the appetite was good, but there was an occasional diarrhoea and on the twentieth day it began to vomit and showed other signs of stomach and intestinal irritation.

Urinary findings during this time: There was a slight glycosuria amounting to .25% occurring about every fourth day. The specific gravity of the urine was 1.033, quantity 187 c. c. daily voidance, with 2.7 gms. urea, and a marked increase in indican.

We think the lesion was accidentally corrected about this time as it could no longer be palpated. The animal was then allowed to run free for twelve days and was relesioned, this time in the cervical region, (first or second.) There were no physical changes following this, an no glycosuria occurred. Specific gravity was increased to 1.038, and the quantity had risen to 212 c. c., urea 2.6 gms., with only an occasional trace of indican. The animal was again lesioned, rotation between the ninth and tenth thoracics. Weight during the following thirty-two days remained about constant. There was an occasional trace of sugar in the urine. The specific gravity was 1.041. Quantity 213 c. c., with 2.6 gms. urea per 100 c. c.

Post mortem: Examination showed a marked rotation of the tenth thoracic with a lateral curvature.

Animal No. 12. This animal did not normalize well, and therefore was not lesioned.

Animal No. 13. This dog was a male in good condition in every respect, about five years of age.

Normalization: The weight continued to increase from 16,200 to 16,600 grams during the twelve days of normalization, appetite and feces remaining normal.

Urinary findings: There was no sugar in the urine. The specific gravity was 1.027, average daily quantity 249 c. c., with 1.7 grams of urea.

After lesion, rotation in the lower dorsal region: The animal was observed for thirty-two days. The weight remained about constant with daily variations; the appetite and feces remained normal. There was a constant glycosuria, averaging about 25% during the entire time. The specific gravity was 1.024, quantity 304 c. c., with 1.7 grams of urea. There was an increase in indican and albumin.

Post mortem: Dissection showed a marked rotation of the tenth thoracic vertebrae with much discoloration and congestion of the adjacent tissues.

Animal No. 14. This was a male, weighing 9,425 grams, with poor nutrition but rapidly increased under good care. The appetite became good and the feces normal.

Normalization: This animal was given good care for two weeks, and then caged for twelve days, during which time it improved physically, and increased in weight.

Urinary findings: The urine showed no sugar. Its specific gravity was 1.034 and average quantity was 112 c. c., with 2 grams of urea. There was an occasional trace of indican but no other abnormal findings.

After lesion, rotation in lower thoracic: This dog was carefully observed for sixty-one days. There was a constant increase in weight from 9,425 grams to 12,000 grams. The appetite remained good and feces normal with the exception of an occasional slight diarrhoea. There was a contsant glycosuria which began on the day following the lesion. It increased from a trace to .25% on the thirteenth day. From this time on it varied from a trace up to 5% and continued until the dog was killed. The average specific gravity was 1.039, the quantity of daily voidance 168 c. c. with 2.7% urea.

Post mortem: Dissection showed a rotation of the tenth thoracic vertebra. The spine was kept for pathological examination.

Animal No. 15. This was a female about seven years old, seemingly in good physical condition, but constantly showed glycosuria.

Post mortem: Examination showed a curvature in the dorsal region. The spine was kept for pathological examination.

Animal No. 16. This animal was a male in good condition, weighing 17,155 grams. The nutrition and appetite were good. Normal feces.

Normalization: The animal was kept for two weeks and then caged for eighteen days during which time the weight remained constant. Good appetite and normal feces.

Urinary findings: Showed only an occasional trace of sugar. Specific gravity was 1.027. Daily voidance 195 c. c. with 2.2% urea. No other abnormal findings. The animal was under observation for the following sixteen days.

The weight increased to 18,800 grams. Appetite was good, and feces normal. The urine showed a presence of from .1% to .5% of sugar. Specific gravity was 1.025, and the average daily quantity 213 c. c. Urea 2.6%. No post mortem was made.

Animal No. 17. This animal was a male about six years old, and seemingly in good physical condition, but constantly showed a glycosuria for six weeks and therefore was not used.

Animal No. 18. Male in excellent condition, weighing 9,800 grams. Appetite good and feces normal.

Normalization: The animal was kept in a cage for nineteen days before being lesioned. Its weight increased to 10,900 grams. No abnormalities in appetite or feces.

Urinary findings: Showed only a trace of sugar on three different days. The specific gravity of the urine was 1.024, and the quantity 184 c. c., with 1.9% urea. There were no abnormal findings.

After lesion, rotation in lower dorsal: The animal's weight slightly decreased, but there were no abnormal feces and its appetite remained good. The urine showed an increase in sugar content from a trace to .25%. Specific gravity was 1.030, quantity decreased to 84 c. c. daily voidance, and there was a presence of 2.4% urea. Indican and phosphates increased, and albumin appeared after the third week. The urinary findings remained about the same for eighty-five days. This animal is still under observation.

Animal No. 19. This animal was caged for nineteen days, but would not normalize. It showed constant glycosuria and was not lesioned.

Animal No. 20. This dog was kept in a cage and carefully observed for sixty days. It showed an occasional trace of sugar in its urine, and was therefore not used.

Animal No. 21. This animal was kept in a cage for fifty-one days with the same results as the preceding animal. The dog was not lesioned.

Animal No. 22. A female weighing 10,200 grams in good condition, with good appetite. There were no abnormal feces.

Normalization: The dog was kept in a cage fifty-two days. It showed no abnormal physical condition, but there was an occasional trace of sugar in the urine.

Urinary findings: The sugar varied from a trace up to .25%, usually only a very slight trace. Specific gravity was 1.033, and the amount 102 c. c., with 2.9% urea per 100 c. c.

After lesion, in mid thoracic region: The dog showed a slight increase in weight and no abnormal physical symptoms.

Urinary findings: After lesion glycosuria was markedly increased from .2% to .5% for forty-eight days. Specific gravity of the urine was 1.029, daily average quantity 197 c. c. with 2% urea. Phosphates, indican and albumin were all increased. No post mortem examination was made.

Animal No. 23. This animal was tested for thirty-six days, but would not normalize. It showed a glycosuria varying from a trace to .5%, and was never lesioned.

Animal No. 24. This animal was tried for nine days, and showed a varying glycosuria, and therefore was not used.

Animal No. 25. Showed similar results to Animal No. 24, and was not used.

Animal No. 26. This dog was kept for forty-seven days, and would not normalize. It was therefore discarded.

Animal No. 27. This animal would not normalize, and was later found to be pregnant.

Animal No. 28. A female about six years old, weighing 6,250 grams, and in good condition.

Normalization: The animal was kept for twenty-nine days in a cage, during which time its weight increased 7,725 grams. The appetite was good, and she showed no abnormal symptoms.

Urinary findings: No sugar was present, Specific gravity of the urine was 1.030. The average daily voidance was 205 c. c., with 3.4% urea, and only a trace of indican.

After lesion: The weight remained normal. The appetite was good, and no abnormal physical conditions developed.

Urinary findings after lesion: A presence of sugar from a trace up to .25%. The specific gravity increased to 1.039, but the urea was decreased. There were no other changes. The animal was kept for nine days.

Post mortem: Dissection showed a rotation of the tenth thoracic vertebra.

Animals Nos. 29, 30 and 31. These dogs would not normalize, and therefore were not lesioned.

Animal No. 32. A male dog in good condition weighing 14,000 grams. Appetite and nutrition excellent and feces normal.

Normalization: The dog was caged for fifteen days before lesioning. It increased in weight and was in good condition all this time.

Urinary findings: There was no sugar present in the urine. Specific gravity was 1.027, the average daily amount 103 c. c., with 2.5% urea.

After lesion, in lower thoracic region: The weight remained about constant. Appetite and general health was good. There were no signs of diarrhoea or constipation, but sugar appeared almost constantly in the urine varying from .25% to .5%. The specific gravity was 1.026. The amount decreased to 104 c. c. daily, with 2 grams of urea. These functional disorders lasted for eighty-three days, when the animal was killed.

Post mortem: Dissection showed a left scoliosis in the lower thoracic region and rotation of the ninth vertebra.

Animal No. 33. This dog was a large male about 2 years old, weighing 22 kilograms. The appetite was avaricious, but nutrition very poor. Examination of the spine showed a readily palpable lesion in the mid dorsal region.

Normalization: This animal was kept for thirty days under the most favorable conditions. but could not be normalized. The appetite was good. The animal ate twice as much as it should have eaten, but frequently vomiting from thirty minutes to one hour after meals. The vomitus showed the contents of the stomach to be almost wholly undigested. It would not gain in weight while in the cage or in the dog room, or while allowed to run free, and the animal showed an almost constant diarrhoea. The urine showed varying amounts of sugar. The specific gravity was high, but the quantity was low. Traces of albumin and indican were almost constant.

Post mortem: Dissection showed a slight rotation to be found between the sixth and seventh thoracic vertebrae, with some discoloration and congestion of the surrounding tissues. The spine was kept for pathological examination. The stomach was found to be distended, the contents had a foul odor and were hyperacidic. A meal consisting of meat and bread given six hours previous was found almost wholly undigested. We have no knowledge as to how this lesion was produced, but do know that it was there when we received the animal, and that the above-mentioned functional disturbances seemed to result from it.

SUMMARY AND CONCLUSION

The above results have been given very briefly, for space would not permit a complete description of the physical condition and urinary findings. Thirty-three animals were used in all, but only fifteen of these could be sufficiently well normalized to be used for lesioning. It is obvious that control work in such a series of experiments is absolutely necessary, or the results would be valueless. In order that we might know the effects obtained were not due to the diet given, or any environmental condition, only six of the animals were kept lesioned at one time, the others remaining normal. The normal animals therefore furnished controls against the lesioned animals. All of these animals were controlled against

themselves, "normalized," and also controlled against other animals before and after lesioning. This insured that the results obtained were not due to accidental causes. There were never any functional disturbances resulting from the diet given, or from the conditions under which these animals were kept.

Each of the fifteen animals which normalized, out of the thirty-three used, showed some functional disturbances from the lesions produced. These disturbances varied from a slight abnormality in urinary findings, which probably would never have caused any serious trouble, to conditions sufficiently severe in nature to cause death. (Animal No. 4.)

Glycosuria appeared or was increased in every animal lesioned, varying in amount from a trace to 5%. That this condition was a permanent functional disturbance is shown by the fact that in animals kept from three to seven months after lesioning, the percentage of sugar either remained constant or increased in amount during the entire time, except in animals in which the lesions were accidentally corrected.

Either constipation or diarrhoea followed lesioning in eight out of the fifteen dogs used. In some cases this was only mild, but in four animals, Nos. 4, 9, 10 and 11, this was of a severe type. Gastro-intestinal disorders resulting in vomiting etc., occurred in five animals.

A severe vaginal infection appeared in one animal (No. 10), which cleared up when the lesion was corrected. A few of the animals which would not normalize were dissected to determine if a bony lesion could be found that might explain the cause. In most cases either specific subluxations or curvatures were found. This part of the work was left to be investigated by the pathologist.

In conclusion it would seem safe to say from the above results we believe that spinal bony lesions, particularly those in the mid and lower dorsal, bear some relation to carbohydrate metabolism and the occurrence of sugar in the urine; that there seems to be some relation between these lesions and constipation and diarrhoea and possibly stomach and intestinal disorders. It would also seem possible that these lesions might in some way predispose to infection. We are undecided as to the effect of these (mid and lower dorsal) lesions on nutrition. In most cases, for the first few weeks, at least, there was no loss of weight following the lesion, but in nearly all cases after being kept for from two to four months, in some instances in less time, the animal began to show trophic disturbances and loss in weight; but it would be unsafe to say with any definiteness that the loss of weight was effected by the lesion produced.

We have often been asked if we attempted any correction of these lesions that caused functional disturbances. We have not tried this as it was our purpose only to determine whether such lesions would produce functional disturbances in perfectly normal animals—and we believe they do. The results of this series have been briefly but definately stated just as they were found. Physicians who read this report will be well able to interpret the results in each case, therefore no lengthy conclusion is necessary.

DEPARTMENT OF PHYSIOLOGY,
AMERICAN SCHOOL OF OSTEOPATHY.

The Endownment Campaign

C. M. TURNER HULLETT, D. O., Chairman Board of Trustees.

The present campaign for endowment funds had its inception in a letter from Dr. J. T. Downing to the Finance Committee suggesting a systematic presentation of our enterprise to a number of wealthy people who are looking for

worthy causes they may help. In the ensuing correspondence on the matter, Treasurer Harry Still suggested that every member of the profession should be able to get at least $100 from his patients. From these germ ideas the plan was developed, and when sent out to a large number of the members of the profession was approved without a dissenting voice. The plan in detail was approved by the Trustees, and the money necessary for its operation was appropriated by the Council.

The general plan may be said to comprise two lines of effort. First, the present "retail" line, the objective in which is to collect a large number of small contributions. The educational effect, on both the profession and the public, of this effort will be worth its cost. It will cause the profession to think more and talk more about the movement, from which they will know more about it; while the public will be educated in the possibilities of the science of osteopathy, and of the aims and ambitions of the profession. Every member of the profession can do something along this line if he will. A bunch of booklets, to be had for the asking, mailed out to a list of people, will produce a favorable impression in showing that the profession is alive and progressive, and this impression, reflecting upon the member of the profession whom they know will in that way be a direct benefit to him.

The second or "wholesale" line of effort will be taken up later when the first is well under way. Probably a special committee to plan and supervise this work will be necessary. This committee will undertake to enlist the interest of wealthy people, both those they may approach independently, and those referred to them by members of the profession. The details of this work will probably be considered at the coming meeting in Chicago.

One of the first questions requiring attention when this campaign was under consideration was as to the actual proposition we could present to people when asking for money. A statement of our good intentions was not enough. To say to a man that we wanted some kind of an institution, some where, some time, would not be very "fetching." Hence, Chicago for the location, and an architect's plans for the building we want. With these, we have a clearcut, definite proposition, and can show people just what we want, and just what their money is to be used for.

The job of getting a mailing list was bigger in the reality than in the prospect. The last A. O. A. directory with 2,300 names was a base line from which to work. The *Osteopathic Physician* supplied two lists. Dr. Effie York sent on the list used in the promotion work for the A. O. A. in San Francisco. Dr. Chiles had a list of non-members of the A. O. A. he was compiling. Finally there was the last general directory of the profession of 1908. These lists were all checked up, one after the other, to eliminate duplications. The net result was a list of about 5,200 names, of which not quite 100 were reported "Not called for" by the post office department. No rechecking was done, so that there were occasional duplications, and an occasional name missed. Incidentally this work has thrown some light on the numerical strength of the profession. Where two of the same name were together, only one was counted; this would add about 500. From some data, it seems probable that about 500 of graduates of the colleges do not appear in the list, possibly for the reason, in some cases at least, that they are out of the practice. The sources of this list are three years old, excepting the A. O. A. membership. The last three years' graduates of the colleges are therefore not included, about 1,000. So that the total strength of the profession seems to be about 7,000 members.

The matter for the booklet is the product of half a dozen reviewers, besides

being read and passed upon by twenty-five or thirty more persons. It just missed being rewritten by a world-famous literateur, the only reason he did not do it being, "five hundred dollars, check with the order." A satisfactory mechanical make-up was secured after some trying delays and disappointments. It is made of a size to be enclosed in an ordinary envelope, for convenience in distribution. The list of officers was included in the booklet simply as indicating that the enterprise was no dream, but that it was fully organized and ready for real business. In some cases it may seem best that they should not appear. To provide for that the names are put on a separate leaf so it may be torn out without marring the other matter.

It can be readily seen that this campaign has meant a lot of work and considerable expense. But it had become a necessity. There had been time enough to clear up the ideas of the profession as to what was wanted. It had grown to the point where it was becoming a burden to men in practice to look after the details of its management in the Finance Committee and the Council, and it was not large enough to profitably employ a manager. It could not go back. The only way was to push it rapidly forward.

Subscribing and paying out of their own pockets by members is a real sacrifice, and could not be unduly urged upon them. (Although a subscription having been made is an obligation in honor to be met. A lot of people who have neither paid a cent on their subscriptions or vounchsafed a word in explanation of their default, should be brought to book by the profession some of these good days.) But in this campaign no sacrifice is required. On the other hand, members will benefit directly in the product of the Insitiute, and in the advertising that the movement will give to osteopathy among those who see the booklet. There might be good reason for a member not subscribing his own money, but there can be little reason for a member refusing to do something in this line. There is something wrong with his think works if he feels ashamed to present this matter to his patients. He ought to take pride in showing them what his profession is doing. The orders for booklets are coming in ten to fifteen a day, for 200 to 400 booklets. They ought to be coming for 5,000 booklets a day. As this is written the orders are jumping up, since receipt by the members of the sample booklet. It will greatly facilitate matters at this end of the line if members will attend to this promptly. The orders to the printers can be given, and the entire matter gotten out of the way before the time for the meeting at Chicago. Send in your orders! If your people are away or going away soon for the summer, send the orders just the same. The booklets will keep until fall.

NEW ENGLAND BLDG.

Research Our Great and Only Hope

O. J. SNYDER, M. S., D. O., PHILADELPHIA.

The medical profession generally has contented itself in affecting the belief that osteopathy is but a "transitory fad," and that like many other unproved innovations will in due course of time fade away into the limbo of oblivion. The question as to the permanency of osteopathy has as a matter of fact caused some apprehension within our own ranks. Many a one has asked, and many a time has the question been raised, "Will the practice of osteopathy endure as a complete and an independent system of therapeutics?"

To answer this very vital and disturbing question we must determine: First, What constitutes the Practice of Osteopathy? Secondly, Is it founded upon verifiable and demonstrable principles, and is therefore scientific?

I will at this juncture not endeavor or attempt to answer the first proposition fully or completely. We have had proposed many definitions of osteopathy but suffice it to submit simply at this time that the Practice of Osteopathy is primarily the discovery of Dr. Andrew Taylor Still, viz: Anatomical perversion as the cause of disease and anatomical adjustment its cure. We might consistently add that in the application of the osteopathic philosophy we employ all that has been demonstrated as scientific, rational and effective in the great and varied arts of therapeutics.

Secondly, Is osteopathy founded upon natural laws? Is it the truth? If so, it will positively endure and prevail for all time and none other will supplant it, for truth does not compromise,—it is complete and hence there can be none other. Is osetopathy therapeutic truth? There can be but one way of determining that and this brings us to the title of this argument—"Research Our Great and Only Hope."

To those who would pin their faith to the experimental phase of osteopathy and trust to results achieved by practice, I will only say that such procedure is not scientific,—not defendable and can never advance the art of osteopathy to an unassailable position where she can point to the *Reasons* and the *Wherefores.*

Practice, results as gleaned from simple practice, reduces osteopathy to the plane of medical practice, i. e., makes it simply empirical. To establish it on a scientific, and hence upon an enduring basis, we must expound and elaborate the laws of nature upon which the practice is founded and demonstrate their application to and operation in the human economy; and hence again—*Research.* The time has come in our history when we must demonstrate to the world the scientific laws that underly our philosophy and upon which the art of osteopathy is founded.

Empiricism has been the undoing of the medical practice. No one is more aware of this than are the scholars of the medical profession themselves and they have accordingly been most active these past several years in establishing research institutes with other people's money. Can you realize what vast sums have been supplied by Rockefeller, Carnegie and others for the purpose of investigation into the cause and treatment of certain and specific diseases that infest the human race? As a further illustration of what is being done along these lines I will cite for you an institution—hardly known to any one save those directly connected with it,—the "Oncological Hospital," established here in Philadelphia for the sole purpose of learning the cause and treatment of cancer. Conceived of and set into operation by a company of M. D.s, aided by lay friends and supported largely by funds obtained through politics and legislation from the State treasury, this institution has been experimenting as to the cause and cure of cancer for some years.

There is no need of profuse argument revealing the extensive efforts on the part of the M. D.s in the matter of Research endeavor and thereby fortifying their philosophy and incidentally their practice and profession.

In these days of our superiority and prosperity, let us not deceive ourselves into a thought of unassailable security. Let not our unprecedented success and achievements be our very undoing. Remind yourselves of past history in such instances as over-confidence and consequent lethargy. When Rome was the mightiest political and military power in all the world she fell into lethargy, neglected the very principles that made her so powerful and became imbued

with a sense of her impregnability. No wonder the inevitable downfall. It would have been vastly better for the Northern armies if First Bull Run had been lost to them—whereas victory led them to a conclusion that all was won and the war was over.

Mind you, fellow osteopaths, — a second Bull Run may yet have to be fought—yes, must yet be fought! Ours shall not be a Roman Empire reared but to crumble and fall. Let us be alive to the requirements that will guarantee for us the safeguards that will make secure and defend us in our stronghold against all aggressions from without and from the still worse,—the insidious betrayals (through ignorance) from within.

No one would contend that our philosophy has been so conclusively demonstrated and established that definite and specific physiological action can be evoked in any and all individuals under all varying circumstances and conditions and that osteopathic treatment is an invariable specific. No one would gainsay that the osteopathic philosophy is well founded. Reasoning abstractly it is logical and incontrovertible. What is the experience in our practical application of this philosophy? So co-operative that many are prone to accept these results of practical experience as sufficient and conclusive. As a matter of fact, however, occasions occur when the expected "response to treatment" does not ensue! What is the reason or explanation?

Lack of clarification and incomplete classification and correlation of essential data and conditions involved, the physiological importance and significance of which has not as yet been sufficiently elaborated and made applicable. Our etiology, pathology, osteopathic symptomology and therapeutics must be further evolved, verified and facts classified. In proportion as this is advanced will our practical skill and professional usefulness be enhanced. There is but one way of achieving this and that is through Research.

What service can each of us render in the enthronement of osteopathy upon the pedestal of science?

What service has man rendered for the establishment and perpetuation of policies or principles in which he believed! We need not search ancient or medieval history for evidence. Recall just a little of our own brief history. It is fraught with sacrifices inconceivable and incomprehensible. Comfort, money, life itself has been freely offered and freely consumed upon the altar of sacrifice.

What are you, what is each one of us willing to offer that the principles in which we not only believe, but out of which come the very means for our livelihood, may prosper and become consistently and permanently established?

Many are not qualified and some who are have not the disposition to do this necessary work of scientifically demonstrating the truth that has been projected upon which our philosophy is founded and to further unfold the possibilities encompassed by this system. While nearly all of us have been busily engaged in devoting every hour and every ounce of strength to the up-building of a lucrative practice, there have been a few who could and did delve into the underlying scientific basis upon which the art of osteopathy is founded and have produced data sustaining our hypothesis and our philosophy and have thereby commanded the respect and admiration of the educated world. This work has been done at a great sacrifice on the part of these generous philanthropists. The time has come, however, when we all must pay tribute to this work. It concerns us all. In proportion as the cause prospers will we prosper individually. Plans have been formulated; designs have been worked out; an institution for scientific research—an appropriate building for the study and unfolding of the scienctific principles underlying

osteopathy, is to be,—yes, will be erected. Much money has already been contributed. Much more is required. Who has not done his or her part? Who is willing to share in the benefits without sharing in the cost? Is there any one insensate to this moral obligation? We believe not. Many have as yet not had opportunity of doing their part. An auspicious occasion is upon us—a time when such contributions will be especially timely and in order. The time will be July 25-29 and the place Chicago. Opportunity will be afforded to any who have not already subscribed to do so and to those who have to increase theirs if they so desire.

But we can not hope to raise sufficient money for this great work among ourselves. We must receive help from the public. For a well directed canvass for funds from friends and public spirited citizens, use should be made of the splendid booklet just issued by the Board of Trustees of the Research Institute. This little treatise is perspicuous, comprehensive and sufficiently brief to make possible the reading of it by even the most busy. It presents the whole scheme in a most dignified and appealing manner. No extensive campaign for funds should be attempted without it.

This is a glorious opportunity to further the great cause of osteopathy, and glorious, most extraordinarily glorious, is the work that has already been done. Its future will be assured to all of us and this Temple of Osteopathic Research will be to us the vatican of our hope and inspiration. May it prosper speedily so that he to whom we owe it all may yet behold and bless it before his vision shall have closed to earthly things. May his benediction santify if for the use to which it is to be put, and to him shall it be a fitting monument as long as time shall last.

WITHERSPOON BLDG.

The Chicago Meeting

FROM THE CHAIRMAN

We wish to announce to the entire profession and their friends attending the A. O. A. Convention that the Arrangement Committee through the Information Department has made provision for distributing your mail during Convention week.

A United States mail clerk will be in attendance every day, and will be assisted by the Information Committee and others, if necessary, in promptly delivering your mail. Please notify any who may wish to reach you by letter, telegram or telephone to address you care of the A. O. A. Convention, Headquarters Hotel LaSalle, Chicago.

No matter where you may room during the week, have your mail addressed to headquarters to insure its safe and prompt delivery.

J. R. MC DOUGALL, D. O.,
Chairman Arrangement Committee.

FROM THE SECRETARY

The letters I have received from many osteopaths read as follows: "Yes, we will be at the Convention in Chicago and will help all we can to make it the best one ever held."

Our Committee has arranged to entertain 2,500 or more.

Come Monday, July 24th, so you can meet with the States that will have their meetings here.

You want to be here for the reception Monday night and meet your old friends and fellow workers. We shall expect you.

FRED W. GAGE, D. O.,
Secretary and Treasurer.

TRANSPORTATION NOTES

We have been able to secure a very liberal rate to Chicago in July, but it is on the *certificate plan.* That is to

say, the ticket must be purchased to Chicago paying the regular one way rate, and taking from the agent a certificate showing that the ticket was purchased on account of the Meeting of the American Osteopathic Association and showing the amount paid for such ticket. These Certificates are validated by a regular agent of the Central Passenger Association who has been employed to attend our session for three days. On presenting this validated certificate to the agent a return ticket may be had for one-half price.

The Certificate is absolutely necessary and every person making this trip is urged to procure one, even if he does not intend to return in such a way as to avail himself of the half rate. One thousand such certificates are necessary in order to secure this rate. There will be no trouble about this number, however, if all purchasing tickets will aid the others by securing the certificate.

Better notify your ticket agent several days in advance that you will require such a certificate, as some of the smaller offices may not have them; then present yourself at the ticket office in ample time before taking the train to secure this certificate as several minutes will be required for executing each of them. Better attend to it the day before. At small offices possibly the agent may not have the certificate. If so, purchase a local ticket to the nearest regular station and secure the certificate there. We urge every member to procure the certificate and present it at the meeting. We have been to considerable expense to secure this rate, and it is not fair to those who wish to avail themselves of it for them not to secure it through carelessness or indifference on the part of others. The tickets permit of return as late as August 1st.

All of the passenger associations have concurred in this except the Pacific Coast, from which territory a rate of seventy-two dollars and fifty cents ($72.50) for the round trip has already been established. The start should be made from that territory on the sales of July 19th and 20th.

We are going to have a big attendance at this Chicago meeting and we want all to come right and go home happy.

JOSEPH H. SULLIVAN, D. O.,
Chairman Transportation Committee.
CHICAGO.

ARRANGEMENT FOR CLINICS

The Committee on Clinics can report that their work is well under way.

The Osteopathic Clinics at Bethesda Mission have furnished a wealth of material and those cases typifying conditions in daily practice will be selected for demonstration at the Convention. To insure their presence at the appointed hour, an automobile has been impressed to transport the patients.

We trust the Clinicians will accompany all demonstrations with a complete and minute explanation of their every act.

Aware of the fact that the clinical feature, in the past, has not been a marked success, this year an especial attempt will be made to so introduce the work that each and every individual, in all parts of the convention hall, can easily discern and interpret the methods peculiar to each clinician.

To give new ideas to the isolated practitioner is the endeavor towards which our efforts are bended, and ample time has been allotted for a free discussion at the termination of each session.

We wish to demonstrate the verity of Shakespeare's taunt:

"How the fool that hath been sent to Rome
Exceeds the fool that hath been kept at home."

FRANK C. FARMER, D. O.
Chairman Clinic Committee.

RECEPTION COMMITTEE

The Reception Committee assisted by the Information and Hall Committees

will be on duty in the lobby of the hotel Monday and Tuesday.

Dr. J. D. Cunningham, Chairman, for Monday, and Dr. G. R. Boyer, Chairman, Tuesday.

Owing to the great number of trains and stations it will be impossible to meet all as we would like.

Dr. Edwin M. Spates, 81 E. Madison street, chairman of train committee, will be pleased to meet any one who wishes to be met, and notifies him in advance.

THE FRANK PARMELEE COMPANY, authorized Railroad Transfer, have their uniformed agents on all trains entering Chicago, who will issue checks for baggage to hotels and residences for visiting members. The service is prompt and efficient. The charge for same is as follows: One trunk and ride in bus for passenger to all hotels in loop district, fifty cents. Each additional piece of baggage, twenty-five cents.

The management of this company have kindly consented to have their employees act in unison with the Local Committee of the A. O. A. in giving information to visiting delegates at all railroad stations in Chicago.

FURMAN J. SMITH, D. O.,
Chairman of Reception Committee.

ENTERTAINMENT COMMITTEE

Don't forget to reach Chicago in time for the reception, Monday evening, July 24th.

We are planning it especially for you who are to come and shall feel greatly disappointed if you do not attend.

The cultivation of friendship and unity among us is just as important as are the discussions of technique.

So be sure to come!

Also, it is our desire to have meeting places for all fraternal organizations planning reunions.

Will the officers of such organizations write us concerning their plans?

Remember, we are looking forward to shaking hands with you Monday evening, July 24th, in the beautiful reception rooms of the LaSalle Hotel.

BLANCHE MAYES ELFRINK, D. O.,
Chairman Entertainment Committee.
39 S. STATE ST., CHICAGO.

INFORMATION BUREAU

The Information Committee respectfully requests that those desiring to secure rooms outside of the loop district for lodging during the Convention will kindly notify us at once as to the prices they wish to pay, and distance, governed by time to be consumed in reaching the Convention Hall. Further, if Secretaries of Alumni Associations, sororities, and fraternities, will kindly forward to us names of their representatives who expect to attend the Convention, it will greatly facilitate locating all such members during the meeting.

Any further suggestion as to the efficiency of this Committee will be gratefully received by—

F. E. DAYTON, D. O., *Chairman.*
3327 W. JACKSON BLVD., CHICAGO.

THE PUBLICITY SIDE

The Press Committee is doing its full part to give the widest possible publicity to the A. O. A. Meeting through the Chicago newspapers, and, ultimately, will do so through the Associated Press. Good, careful reports will be prepared and furnished both to morning and afternoon newspapers all through convention week. In advance of the meeting data will be offered the Chicago newspapers, as the time for holding the meeting approaches. Photographs of the officers, etc., are being arranged to be delivered to the newspapers, if they will use them, through the courtesies of Dr. Frank Baird, who is connected with a local photographic studio.

It will be the aim of the Press Committee to utilize this great event in osteo-

pathic history to the full as a means of education and advertising for the joint benefit of the profession and those of mankind in need of osteopathic attention.

HENRY STANHOPE BUNTING, D. O.,
Chairman Press Committee.

HALL COMMITTEE

The Hall Committee has completed its arrangements for the several State Meetings, which will be held on Monday, July 24th, 1911, the day prior to the A. O. A. meeting, at LaSalle Hotel, Madison and LaSalle streets, Chicago.

The Committee in charge of the Illinois Osteopathic Association, regarding the seating capacity and keeping of order, are Doctors M. P. Browning, T. S. McCall and Wm. Hartford. The Indiana Osteopathic Association, Dr. J. H. Baughman.

South Dakota, Wisconsin and Missouri will be named as soon as we hear from them.

A. O. A. Meeting Tuesday—Dr. George Carpenter, *Chairman,* Dr. J. C. McGinnis, Dr. F. J. Norris, Dr. C. R. Palmer.

A. O. A. Meeting Wednesday—Dr. H. H. Fryette, *Chairman,* Dr. W. Elfrink, Dr. Chester Norris, Dr. W. C. Carter.

A. O. A. Meetings Thursday, which will be Lady's Day on Hall Committee—Dr. A. J. Fogarty, *Chairman,* Dr. F. B. Butcher, Dr. E. L. Robey, Dr. A. L. Browne, Dr. E. E. Sandus.

A. O. A. Meeting Friday—Dr. W. B. Allen, *Chairman,* Dr. Edwin Thawley, Dr. E. W. Herrick, Dr. J. H. Baughman.

Dr. W. B. Allen, *Chairman,*
Dr. Edwin Thawley,
Dr. E. W. Herrick,
Dr. J. H. Baughman.

The Committee will try to keep order and quiet so that the speakers will not be disturbed, and all attending the meeting will be able to hear all the proceedings.

Ample rooms will be supplied with equipment for the different State Meetings as well as the various Committee Meetings. so everybody come and have a good old fashioned osteopathic feast.

E. R. PROCTOR, D. O.,
Chairman Hall Committee.

REGISTRATION

We extend a hearty and cordial welcome to every Osteopath to come to Chicago the last week in July and enjoy the feast-intellectual and otherwise, that we have prepared for your delectation.

The committees have certain preparations made and it will be required that each and every one of the visitors refer to the announcements given out by the respective chairmen, and act accordingly.

The Chairman of the Registration Committee desires to inform you that you are required and requested to REGISTER at the registration booth upon your arrival at the Hotel LaSalle. This booth will be found on the 19th floor at our headquarters. The place will be designated by a conspicuous sign so that every one will be spared the necessity of looking for it. Next to this booth will be the Information Bureau. The registration blank appears as below:

FIFTEETH ANNUAL CONVENTION OF THE AMERICAN OSTEOPATHIC ASSOCIATION

Chicago, Illinois, July 25 to 28, Incl., 1911

Name .....
City .....State.....
Office Address .....Phone No.....
Residence Address.....Phone No.....
Graduate of .....College, Class of.....
Member of fraternities or sororities.....
Member of A. O. A.....State Ass'n.....
District or City .....
Stopping at.....Hotel, Room No.....
Accompanied by: (mention relatives, etc.)....

Notice. Please fill out in full and oblige,
The Committee.

These blanks will be on hand both at the Registration Booth and the Information Bureau. Get one as early as possible, fill out in full and hand in im-

mediately to the attendant in charge of Registration Booth. Membership Badges will be issued to A. O. A. members upon registry. These will entitle the holder to vote.

Your co-operation in this matter is of great and vital importance and again we ask that you be prepared to fill out the blank *in full.* Thank you in advance. We may not have the time later to do so, but we shall mean it just the same.

A. P. KOTTLER, D. O.
Chairman Registration Committee.

ANNUAL DINNER

The dinner on Friday evening is planned as a fitting climax to our meeting, in which fun and relaxation will take the place of the serious program of the week.

We shall give this on the top floor of the Hotel LaSalle, in the largest, best ventilated banquet room in the City where the acoustic properties are perfect. The dinner we want an annual love feast of good cheer and merriment, in which every one may have a thoroughly enjoyable evening.

The LaSalle has furnished the majority of all large functions during the past winter in the city, so we shall be equal to the emergency of our largest banquet.

We will announce the list of speakers in next issue of the JOURNAL.

ALFRED W. YOUNG, D. O.,
Chairman Banquet Committee.

Program 1911 A. O. A. Convention.

Monday, July 24.

Meetings of State Organizations.

Evening — Reception.

Tuesday, July 25.

9.30 Invocation.
Address of Welcome.
Response.
President's Address ..... ARTHUR G. HILDRETH
10.30 The Significance and Importance of the Osteopathic Lesion (25 minutes) JAMES L. HOLLOWAY
11.00 Skiagraphs of Osteopathic Lesions (Stereopticon) (30 minutes).... SIDNEY A. ELLIS
11.30 Photographical Osteopathic Lesions (Stereopticon and Special Skeleton) (30 minutes) CHARLES E. FLECK
12.15 The Hypothetical Lesion (15 minutes) ..... HENRY S. BUNTING

Clinics, FRANK C. FARMER, Chairman

2.30 CLINICS (Demonstrations on actual cases emphasizing (a) diagnosis and (b) therapy. Sane and safe treatment.)
Technique of Cervical Region ..... CHARLES E. STILL
3.00 Technique of Dorsal Region..... C. W. JOHNSON
3.30 Technique of Curvatures ..... J. W. HOFSESS
4.00 Technique of Pelvis (Innominata, Sacrum and Coccyx) ELLA D. STILL
4.30 Osteopathic Treatment of Organic Kidney Lesions, FRANK H. SMITH

Evening—Reunions, Etc.

Wednesday, July 26.

9.00 Osteopathy in the Field of Preventive Medicine (25 minutes)..... D. W. GRANBERRY

SECTION—GYNECOLOGY AND OBSTETRICS; OLIVE CLARKE, Chairman

9.30 Diagnosis of Pathological Pregnancy (25 minutes)..... LILLIAN M. WHITING
10.00 Dysmenorrhoea (25 minutes) ..... LOUISE P. CROW
10.30 Bony Lesions versus Pelvic Lesions (25 minutes)..... BARBARBA MACKINNON
11.00 Some Common Structural Abnormalities of the Uterus (15 minutes)... C. A. WHITING
11.45 Report of Committees on Education and Publication.

Program continued

2.30 CLINICS (Demonstrations on actual cases emphasizing (a) diagnosis and therapy (b) sane and safe treatment.) Technique of Dorsal Region .....GEORGE J. HELMER
3.00 Osteopathic Indications of the Anatomy of the Vertebral Column .....FRANK P. PRATT
3.30 Osteopathic Treatment of Organic Heart Lesions W. B. KEENE
4.00 Etiology and Pathology of Certain Affections of the Spinal Articulations (25 minutes) .....RALPH K. SMITH
4.30 Osteopathic Treatment in Disorders of Children (20 minutes) .....ROBERTA W. FORD
Evening—Report of A. T. Still Research Institute (Research results of the past year) E. R. BOOTH, Chairman

Thursday, July 27.

9.00 Pathology and Treatment of Pulmonary Tuberculosis (20 minutes)..W. B. MEACHAM
9.30 Report of A. T. Still Research Institute.
11.00 Business—Election.
12.30 Demonstration of Osteopathic Lesions on Articulated Spinal Column (20 minutes) H. H. FRYETTE

2.00 CLINICS (Demonstrations on actual cases emphasizing (a) diagnosis and therapy (b) sane and safe treatment.) Technique of Hip-joint (Tubercular and Dislocations) GEORGE M. LAUGHLIN
2.30 Technique of Pelvis (Innominata, Sacrum and Coccyx) CLARA WERNIKE
3.00 Technique of Ribs and Flat Foot.....HOMER E. BAILEY
3.30 Technique of Curvatures, and Clinic Talk HERBERT E. BERNARD
4.00 Osteopathic Hygiene (25 minutes).....L. LUDLOW HAIGHT
4.30 Treatment of Typhoid Fever (20 minutes) .....ARTHUR M. FLACK
Evening—Report of Committee on Legislation and Medical Council,* ASA WILLARD, Chairman

Friday, July 28

SECTION—EYE CHAS. C. REID, Chairman

9.00 Clinics—Optic Neuritis.....CHAS. J. MUTTART
9.30 Glucoma .....PERCY H. WOODALL
10.00 Obstetrics (resume of experience) (25 minutes).....M. E. CLARK
10.30 Treatment of Infantile Paralysis (20 minutes).....GRACE C. STRATTON
11.00 Business.
2.00 Osteopathic Applied Anatomy (25 minutes).....R. W. BOWLING
2.30 Neuritis (20 minutes).....MRS. FURNAM J. SMITH
3.00 Treatment of Pneumonia (20 minutes) .....J. A. OVERTON
3.30 CLINICS (Actual Demonstrations.) Technique of the Cervical Region.....HARRY W. FORBES
4.00 Technique of Lumbar Region and Anterior Abdomen JOSEPH H. SULLIVAN
4.30 Presentation of Cured Cases.....F. A. TURFLER
Evening—Dinner—ALFRED WHEELOCK YOUNG, Chairman.

*PUBLIC MEETING OF LEGISLATIVE CONFERENCE, THURSDAY EVENING, JULY 27TH

Report of Legislative Committee, and Address on Legislation.....ASA WILLARD
Discussion Lead by A. C. HILDRETH, HARRY M. VASTINE, GEORGE W. TUTTLE, ORR SANDERS
Consideration of Public Health Bills; How they are Frequently Used by Our Opponents as Mediums to Curtail the Osteopath's Usefulness.....C. F. BANDEL
Consideration of Vital Statistic Bills; How These Otherwise Meritorious Measures are Frequently Manipulated by Medical Trust Doctors to Humiliate Osteopathy, E. M. BROWN
Considerat on of School Physicians' Bills, Frequently Drawn to Eliminate All but "Regulars" from Being Examiners; Other Objections.....C. L. KINGSBURY
New Jersey's Legislative Experiences; Results Gaind.....C. E. FLECK
Gelamings from New Jersey 1911 Campaign.....D. W. GRANBERRY
The Iowa Campaign; Whys and Prospects.....U. M. HIBBETS
What Colorado D. O.s Have Continuously Stood For; Results.....C. C. REID
Lessons and Incidents from Colorado's Last Legislative Fight.....D. L. CLARK
The Kansas Situation; Where We Stand.....C. E. HULETT

Some Official Routes

THE OSTEOPATHIC SPECIAL TRAIN FROM NEW YORK TO CHICAGO IS UP TO YOU D. O.'S IN THE EAST

Every D. O. in the East, from Maine to Eastern Pennsylvania, and throughout New York State, will receive this week a circular letter from this committee, giving full details of transportation to the A. O. A. Convention in Chicago. You are requested to read it carefully, make up your mind to join us if you have not already decided to do so, then sign and return promptly the postal card which will be enclosed with the letter.

Until the replies are received, we cannot be certain that we will run a private train from New York to Chicago. The success of our Osteopathic special train is up to you, D. O.s in the East. This committee will arrange the details; you sign the postal and we will do the rest.

Any questions will be answered promptly by the Chairman of this committee.

NORMAN D. MATTISON, *Chairman*
Transportation Committee for N. Y. City and State Societies.
106 CENTRAL PARK WEST,
NEW YORK CITY.

THE ROUTE FROM THE SOUTHWEST

Dr. A. B. King, of the Transportation Committee, has arranged with the FRISCO SYSTEM as the official route from the southwest to Chicago. The road advertises in this issue of the JOURNAL and will send literature later to all in the territory giving time of departure, train connections, etc.

Dr. King, whose address is Third National Bank Building, St. Louis, Mo., invites any one who intends to make the trip to write to him for information and he offers to make Pullman reservations, etc. Those living outside of the Frisco system territory but who can come through St. Louis should have their tickets read from St. Louis to Chicago via the C. E. and I. The profession in Texas and the farther southwest are urged to arrange to be with the party using the Frisco System.

Don't forget to secure the certificate when you buy the straight ticket to Chicago. It enables you to return at half fare.

TE GREAT LAKES ROUTE TO CHICAGO

A most desirable trip to or from Chicago will be over the Great Lakes from Buffalo, either all the way by boat or as far as Detroit by boat and thence to Chicago by rail. Ordinarily there are two first class lines of large boats between Buffalo and Chicago, the Northern Steam Ship Co. and the Erie and Western Transportation Co. known as the "Anchor Line." It is reported, however, that one of the Northern Steam Ship Co.'s boats was destroyed by fire about the middle of June and that the other was seriously damaged. At this date we are not able to state what the conveniences of this line will be. "The Octorara" of the Anchor Line will leave Buffalo at 2 P. M. on Thursday, July 20, arriving in Chicago on Tuesday at 7 A. M. This trip gives from five to seven hours in Erie, Cleveland, and Detroit, and Sunday from 9 A. M. to 11 P. M. at Mackinac Island, Mich., which is one of the most delightful spots in summer on the continent. Fare American plan only, Buffalo to Chicago $25.50, round trip, $48; meals and berths between Mackinac Island and Chicago extra.

The Cleveland and Detroit Navigation Co. runs first class boats between Buffalo and Detroit leaving Buffalo every day at 6 P. M., arrive Detroit next morning at 8; leave Detroit at 5 P. M. and arrive Buffalo next morning at 9.

Tickets over several of the trunk lines from east to west are good over this line of boats for transportation. More explicit instructions will be printed in the next issue. All who contemplate going by the Great Lakes should book with the Steam Ship Companies at Buffalo at once, as July is the rush season.

For transportation via Anchor Line, address H. D. Hosmer, Anchor Line Dock, Buffalo, N. Y. For D. and C. Line address C. L. Perkins, General Agent, Buffalo, N. Y.

All who will, may come! Rendezvous at Buffalo!

All who wish to join a party for the Buffalo to Chicago boat trip may notify—

IRA S. FRAME, D. O.,
of Transportation Committee.
1619 RACE ST., PHILADELPHIA.

Attention All Osteopaths!

We want to call the attention of all who attend the Chicago Convention not only to the excellent program prepared by our committee, but also want to say to those of you who desire to hear special subjects or the papers of certain speakers, that there is only one way to hear them, and that is to be in your seat at the time stated in the program for such paper or demonstration. Our program is an unusually heavy one, and there is but one way we can possibly get through with it in the time allotted us, and that is to have each member present at the exact time scheduled by the program; 9 A. M. means just what it says, and if there are but three people in their seats at that time the exercises will begin as stated.

This notice is given purely for your benefit, and in order that all may know just what to expect, we want every one who attends to enjoy every feature of the convention, and in order that you may do so, Dr. McConnell and his coworkers have prepared an osteopathic feast royal—and we expect to be able to present it just as they have planned.

A. G. HILDRETH, D. O., *Pres.*

ANNOUNCEMENTS

The Illinois Osteopathic Association announces its Annual Meeting at Chicago July the 24th at the LaSalle Hotel.

All Osteopaths practicing in Illinois are herewith extended a cordial invitation to attend this important meeting.

Business of importance will be transacted. This meeting will be devoted mainly to the Legislative situation in this state; papers on the subject will be read and a thorough discussion of every angle and phase of the subject will be threshed out.

Come and take your part in it. Say what you think and help by your presence and activity to make this meeting one of profit to yourself and the profession.

You will be made welcome whether you are a member of the Association or not. If you are not you will become one after you see what there is in it for you in belonging. And we will be glad to have you become a member. We also need you. *Come!*

A. P. KOTTLER, D. O.,
Secretary and Treasurer.

ACTIVE BIDDING FOR 1912 MEETING

In addition to Detroit and Atlantic City which are making well-directed efforts to secure the A. O. A. annual meeting for 1912, Wichita, Kansas, has recently entered the field. The recent annual meeting of the Kansas State organization endorsed the proposition to secure, if possible, the 1912 meeting and the members of the profession in the state are now actively canvassing to secure it. The claim is made that Wichita has a fine hall for the purpose, that osteopathy had its inception in the state of Kansas, and that it is the center of osteopathic population.

A formal invitation has been extended the board which will consider this along with the other claims at the time of the Chicago meeting.

To the Non-Member

Doctor, if you are not familiar with the JOURNAL I want to ask you to read this issue through carefully. If you do this, I am sure you will come to two conclusions: First, that the osteopathic profession has a big work ahead of it, and hence needs, and is entitled to receive, your help; Second, that the Association is prepared to give you in the JOURNAL and the other incidents of membership more than the $5 it asks of you.

If there is anything you want to know about the Association, please write me and I shall give the desired information. I will be glad to send you on your request another copy of the JOURNAL, or the by-laws and code of ethics of the Association if you wish to investigate it further. There is much Research matter on hand which we have not room to print in this issue, which will be continued in the next number.

Perhaps you have received several invitations within the past few weeks to join the Association. If not, it was only because we did not have your address. Fill out one of the applications, or if you have none on hand, a post card request to me will bring one to you. Join the Association now. Line up with the national organization which must be strong, if we are to keep out of the clutches of the political doctors, and help the Research Institute which is essential to establishing the scientific side of osteopathy.

If you will think seriously over the proposition, I am sure you will see that your duty to your own personal interest and your duty to the profession of which you are a part, demand that you join the Association. Join now when your money buys you the most. For $5 you get membership to July 1, 1912, and I will start your subscription to the JOURNAL with the April number, giving you fifteen months for the price of twelve.

Address: H. L. CHILES, D. O.,
ORANGE, N. J. *Secretary A. O. A.*

HOTEL LA SALLE, THE HEADQUARTERS

This is one of the finest hotels in the country and admirably arranged for entertaining conventions. The hotel advertises in this issue from which it may be seen that a very liberal rate has been made for our accommodation. It will be a great convenience, and in fact is due the hotel, if, as far as possible, we be quartered in the hotel; but for those who prefer rooms in private families or more moderate priced rooming places the committee will make arrangements on request.

The hotel may be more than filled by the guests who will assemble there in connection with this meeting, so those who wish rooms in the Headquarters should make reservations as early as possible.

AN OPINION FROM DR. OSLER

The man who knows it all and gets nothing from the Society, reminds one of that little, dried-up miniature of humanity, the prematurely senile infant whose tabetic marasmus has added old age to infancy.

Why should he go to the society and hear Dr. Jones on the gastric relations of neurasthenia, when he can get it so much better out of the works of Einhorn or Ewald? He is weary of seeing appendices, and there are no new pelvic viscera for demonstration.

It is a waste of time, he says, and he feels better at home—and perhaps that is the best place for a man who has reached this stage of intellectual stagnation.—*From writings of Wm. Osler.*

Moral: Attend the Chicago Meeting!

The Journal of The American Osteopathic Association

Published by the American Osteopathic Association

247 Fifth Ave., New York N. Y.

Subscription Price, Five Dollars Per Annum, in Advance

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The A. O. A. and Research Work

When Dr. Guy E. Loudon, at Put-In-Bay, in 1906, launched the proposition to create an endowed research institution to conduct scientific investigation along osteopathic lines, he started us on a line of work, far-reaching in effect, necessary to the life of the profession, and essential in all its bearings; yet one, I fear, the average osteopathist is liable to pass by without fully understanding its relation to our work. At this time there is nothing that could mean more to us than the completion of this institution.

The present unrest and agitation in medical education, brought about largely by the Carnegie Foundation for the Advancement of Teaching and the now notorious report of the Flexner Inspection of all medical Colleges, in which the utter contempt of the institution is shown for osteopathy, makes it doubly necessary for us to make sure our claim to recognition. The same methods which have enabled the huge monopolies to stifle competition are to be applied now to the healing arts and sciences; namely, the regulating of the instruction and controlling the out-put from one centre, by this institution's assuming to subsidize those colleges which do its bidding and punishing those which refuse. So that not only have we the prejudice of the medical profession to meet, but that of this huge sectarian institution; hence, the one means of salvation is the proving by accepted scientific methods of the principles on which our system rests.

It behooves every osteopathist on earth to awake to a full realization of the situation as it exists, and to the absolute necessity of each and every one doing all in his or her power to help complete this great work so ably started. Ably started, because the amount of work already done, and the fund already subscribed and collected, not only speak well for the profession, but guarantee a completion of the undertaking at an early date, if each member of the profession will only add his effort.

Young though our profession is, the showing is certainly a very creditable one. The A. O. A. has fostered and encouraged the movement at all times, and should never tire in its efforts until the funds necessary are raised and the building is erected and the work is put on a practical, systematic and scientific basis. You might say the association has been and is sponsor for the research

work, and that is just as it should be. The A. O. A. has tried to do the best possible for the entire profession at all times, and it recognizes the necessity of this institution; the encouragement in every possible way of all educational work is its duty and pleasure at all times, for our educational work is the foundation of our growth, the basis for our independence.

The guarantee of our future's greatest good depends upon our ability not only to accomplish results, but to *know* how they are accomplished and to be able to *demonstrate* that fact. Our schools are doing a great work, but they have not the time nor the means to devote to this branch of our activities that our progress now demands should be given. They are now training men to do excellent work along scientific lines of research, and this is as it should be. They are starting them right, and by the time we have completed our research institution we shall have numbers of men and women not only competent to do the work, but anxious to explore the yet unknown field that lies before us.

There is not an osteopath on earth that can afford to do other than enter into this work heart and soul. All should add their might, and should work unceasingly until every friend possible has been interested in this splendid movement. With the research institution endowed and thoroughly established, the stability of osteopathy is guaranteed.

A. G. HILDRETH, D. O., *Pres.*
ST. LOUIS.

Shall We Support Research?

A few weeks ago in these columns Dr. Herman F. Goetz strikingly set forth the necessity of scientific research. He showed that whatever claim the "old school" has to be classed as scientific is due to its *researches* into the causes of diseases and its efforts to apply the remedy. It will be recalled that one of the first points made by Flexner in the Carnegie Foundation Report against us (and the other so-called sectarian schools) was that "nowhere is there the faintest effort to connect the laboratory teaching with clinical osteopathy." "Indeed in not one of the sectarian schools does one observe progressive effort even along the line of its own creed."

The JOURNAL devotes this issue to the problems with which the A. T. Still Research Institute has to do. Nothing could so fully justify the movement as the splendid research work here presented. No one may question longer (if he has questioned before) whether there is anything to search for which is applicable to the art of osteopathy. The original animal research experiments here presented by Dr. McConnell and Dr. Deason suggest what can be found out and what is possible of accomplishment with the work really organized and financed.

Yet this is a small part of the work that may be done. Many believe that animal experimentation does not offer the solution of our most pressing problems, but animal experimentation need not be the main feature of the work. The collection of authenticated facts in regard to diseases or certain diseases under osteopathic care and the tabulation of this data is important, and to many the most important. The checking up of medical procedure in many conditions, as the vaccine treatments and the comparison of results under osteopathic treatment may be illuminating and may annihilate the former. The study of the pathology of many obscure conditions under osteopathic care may show vastly different pathology and

different results from that taught in medical texts where cases have been complicated with drug effects. There are a number of lines needing investigation, and it has been shown that we have the workers capable of doing the work and of directing it.

But the most of this work, of whatever line, would require several years to complete. No one feels justified in working one year on a line which he knows cannot be completed for three or five years, and few of us can see our way ahead that far. Here is where we need the endowment so that contracts may be entered into. Having seen what may be accomplished, we cannot justify ourselves in not making it an assured fact. The profession, or a number of members of it, has contributed fairly liberally, all things considered; and having done a respectable share, we are justified in calling, first, for at least small amounts, from our friends who owe something to osteopathy, and this done, we are at liberty to approach the wealthy philanthropist for the larger sums that really count.

The profession has raised about one hundred thousand dollars. Within thirty days the profession can increase this to five hundred thousand in small amounts from its clientele. With a half a million raised by itself, two or three times as much would be an easy and quick matter. If every practitioner raises one hundred dollars from the people whom he has helped to regain health, this institution would be properly financed and assured within six months.

There are two considerations which need to be called to mind. First, that the profession needs this for its own growth and salvation from extinction. We must find out, and must teach the future practitioners, what is withheld from us at present, but what can be found out and verified. Second, we must have this institution for the effect it will have upon the public. It is entirely justifiable for us to consider the changed standing this will give the practice of osteopathy, if it is noised abroad, as it will be, that we have established such an institution with an adequate endowment. Suppose for instance, this had been established several years ago and had been in successful operation when Flexner made his inspection, the sting of his report would have been taken out, for the thing that really hurts is his charge that we as a profession are doing nothing to prove or establish our claims. While this is not true, the fact that we have no institution of the kind makes it difficult to refute his charge that we simply follow osteopathy as a business to make out of it what we can and doing nothing to understand disease and prevent or cure it. We can not afford to have that charge made of us. We shall not survive as a profession if it is true.

The plan now is perfectly plain and the profession is united on it. Those who have not given should give, if even a small amount, five, ten or twenty-five dollars for a term of five years. This will help swell the fund. Besides we can't really work earnestly for it until we have given something to it. But the main thing is to distribute the literature which the A. T. Still Research Institute has prepared as a means of education, and raise in small sums one hundred dollars if possible, each from his clientele.

The effect of properly presenting this matter to people of even moderate means, who have received the benefits of osteopathy, will be splendid. The handsome little booklet, which has been prepared, will be sent you in as great quantities as you can use free of charge

upon request to Dr. C. M. T. Hulett. The effect of this educational matter upon those acquainted with osteopathy will be most helpful. Many of these will be glad to feel that they have an opportunity to co-operate in making osteopathy permanent. This campaign should be pushed, and completed within the next few months. When this is accomplished the Committee will work toward the securing of larger bequests.

Don't doubt for a minute that these larger bequests can be had if we have done a reasonable part. With a million dollars, or even half that sum contributed by the profession and its friends, the philanthropists of the country may with safety be depended upon to do the rest.

Read this JOURNAL carefully. Get into the spirit of this campaign. Realize what an opportunity it gives every practitioner to set osteopathy in a proper light before the people of his community. Think over it, what it will mean to the cause as a whole when it is noised from one end of this county to the other that this new profession has succeeded in founding and endowing such an institution; and think of the real purpose for which this is all done, to acquaint us and thousands who may come after us with the secrets of the human body and in revealing these secrets to make human life longer, and more comfortable and more useful.

Loyalty to the Whole or to a Part

The profession needs that every man and woman engaged in practice be loyal to it. It is difficult to see clear our way ahead without this loyalty. The cause needs not only that we be loyal to its principles and advance them as far as possible, but loyal to its institutions. The institutions connected with the system have a mighty work to do.

The principle of osteopathy is truth, and a truth, which if we develop and make known according to the requirements of science, will some day form the basis in the general practice of the healing art. But how we are obscuring this truth and putting off that day by our shortcomings on the professional side! The medical profession by a dignified position and a professional bearing (at times overdone) is keeping alive a few theories, most of which really ought to die; while we are keeping hidden from the general recognition it should rereceive, a life-giving truth, through a disregard of professional requirements and attainments. We have the brains in the profession to overcome this handicap at the start if we will be guided by reason and have a due regard for what is expected of us.

Our organizations are our hope in this direction. Frequent meetings, social touch and interchange of experience is the means of bringing about high ethical ideas, and conduct becoming a physician. We must have these organizations as much for the development of the practitioner as for their usefulness in legislation. Loyalty to the professional organization is loyalty to Osteopathy as a profession.

In distinction to loyalty to these organizations is loyalty to certain *fraternal* organizations. These may be all right for social acquaintance and enjoyment, but there is danger if carried beyond this. We are constrained to call attention to this by reason of the fact that some fraternities and sororities are urging membership for the professional advantage it will be to their members. The point made is that their members will recognize the claims of membership in the *social* organization as being higher and more binding upon them in referring and recommending professional service

than the claim of membership in strictly *professional* organizations.

Let us follow this to its logical conclusion. We should then have a number of rival secret orders each with a mutual protective feature held together by the "give and take principle." What good would one, or any number of these bodies be to the general cause? Yet if they grow and this feature becomes pronounced, they will become a positive hurt to our necessary professional organizations. We notice the activity of these organizations because we believe that this, to us objectionable feature, has escaped the notice of their members. The JOURNAL does not advise that these fraternal organizations in the schools or in the practitioners be abandoned, but that they be conducted as social and fraternal bodies, which indeed they are, and not as professional bodies which they can never be without serious detriment to the cause in which the members are enlisted. It should be clear to all that one can not pay his obligations to his profession by membership in these fraternities.

We are members of a learned, respectable and increasingly respected profession. Our concerns must be its advancement. Our first consideration in referring cases must be that Osteopathy will be built up as a result of the professional service we are advising. Refer to a personal friend if his conduct of the case will be to the best interest of Osteopathy; but if we have reason to believe that the personal friend is not so competent, we must consider the effect upon Osteopathy first. As a rule those who are identified with the organizations are capable practitioners; their membership in them is an evidence of their earnestness in the cause and their membership gives them the best opportunity to become proficient. Besides members of these bodies are answerable for any unprofessional and unethical conduct which safeguard one does not have with those who are not members of these bodies. A practitioner may be a good fellow and stand high in his fraternity and at the same time have low professional ideas and be rejected by his professional organizations.

In building up our professional organizations, we build up the practice of osteopathy; in building up organizations holding allegiance to other considerations, we may be aiding in tearing it down.

Our Relation to Health Legislation

There seems to be a wide difference of opinion among the members of the profssion as to what our attitude toward federal health legislation should be, and particularly what should be our relation to some of the organizations which came into existence to fight this class of legislation. The JOURNAL receives many letters urging it to call upon the profession to support these organizations and it receives also other letters urging that the Association cut loose from them and keep out of them.

As a matter of fact, the Association has taken no position on the *general proposition* of Federal legislation, nor has it indicated what is thought the members of the profession should do or should not do with reference to these organizations. Thus far it seems best that in the several communities they should act as the need of their community indicated. As we see the proposition, no measure has yet been proposed at Washington which would operate fairly; but this does not mean that a measure having few objectionable features and with many useful provisions may not yet be presented. There is unquestionably a work in the field of sanitation, hygiene and public health which

the government could encourage and direct to the good of the nation. This, then, it should do, and it will not become us to oppose such a measure. In fact, we believe that the Association should prepare a measure which would enable the government to try to improve health conditions without subjecting individuals to some pet form of *treatment.* The prevention of disease by improving or removing those conditions which undermine health should be a fruitful field for government activity.

There is danger in fighting *against* legislation continually and putting up nothing in its place. To become known as chronic objectors is not desirable. No organization can maintain itself indefinitely on a proposition of this kind. It can not maintain the respect of the community on this program beyond a reasonable point, and it can not keep the interest and support of its own friends as a continuous opposition party. An organization must have a more purposeful mission than to simply prevent some one else from accomplishing a plan, and having succeeded in this, suggest and do nothing itself.

Opposition up to a certain point is all right and these organizations have done a most effective and necessary work in killing measures that should not pass, but the time will come after defeating a number of these bills or defeating them a number of times that some measure should be proposed as a substitute for them. No doubt this policy is indicated for the A. O. A., for recently several papers which are fair and friendly to us have made slurring remarks about the osteopaths opposing everything. As vicious as these bills are and as necessary as it is that they should be killed, after they have been killed a few times each, the perfectly proper question may be asked of us, What are we going to do about it? Is nothing needed in health legislation? Are we going to prevent such legislation simply because it gives some other school an advantage over us?

The JOURNAL has pointed out several times that because the proposed Federal legislation would create government positions which we would not be allowed to fill is no reason for us to oppose it; because this legislation would give our old-time opponents more power and prestige is no excuse, in fact or before Congress, for us to fight against its enactment. To do so puts us in precisely the same position we have condemned the medical men for taking when they oppose our demand for regulation in the several states; viz, that they oppose the measure simply because it injures them in giving a better standing to their rivals.

Our position in regard to health legislation, national and state, is delicate. If the proposition is to put the government back of some school of medicine, or to use the government to press or advertise or advance some form of remedy, be it osteopathy or what not, it is bad, and we shall lose nothing in the end by causing such measures to be understood by the public, and opposing them. We are not justified in standing by and see the politicians with the M.D. degree fasten state medicine on the country, for it cuts off development and growth in medical practice. But to oppose a measure which is good for the general public simply because it is bad for us as a school of practice is selfishness of which we should not be guilty.

Conferences on Education and Legislation

Our present By-laws provide for two very important conferences in connection with the annual meetings of the Association. A Conference on Legisla-

tion and a Conference on Education is provided for. The object in providing for these conferences is to get the expert opinion, as it were, of those best informed in the several states, and the A. O. A. not being a delegate body, to provide thus for delegates to discuss these two important subjects. These bodies cannot enact any measures, but hear and discuss the reports of the Committee on Legislation and Committee on Education and make recommendations to the Board of Trustees.

The Legislative Conference consists of the Committee on Legislation and one delegate from each co-operating State Society. The Conference shall meet early in the session and hear and discuss the report of the Committee and may make recommendations to the Board of Trustees, and submit its transactions to the Board.

The Educational Conference shall consist of the Committee on Education, together with one delegate from each of the Colleges and one from each of the state examining boards. This Conference shall consider the report of the Committee on Education and advise with the Committee and may make recommendations and a report to the Board of Trustees.

The meeting last year was the first held since the adoption of these by-laws and as the meeting was so far removed from the most of the states it was deemed inexpedient to attempt to organize the conference; but at the coming meeting it is urged that there be a full delegation to each conference, and the president of each state organization is urged to send the best posted men on legislation in his state to this conference, preferably the chairman of the Legislative Committee of his State organization. In case he cannot attend, send some other well qualified member.

The president of the State organization in each state where there is a member on the State Board of Examination and Registration should also designate such member or one of the members to this Conference on Education and each of the Colleges should also send one delegate to this conference.

The public meeting on Thursday night of the convention will be one of the important features of the great meeting. The need of the rank and file of the profession better understanding our legislative situation is thus clearly emphasized. Dr. Willard has prepared an excellent program and the committee has wisely given it a full evening session.

Open Parliament

Earlier Research Work

It may not be without interest when the air is full, as it now is, of research work to say a few words about the earlier attempts in this direction. It is quite possible that some work, of which I have no knowledge, was done in the early days.

The first real work, so far as I know, was done by Dr. D. L. Tasker at the Pacific College of Osteopathy. This work was reported in the *Osteopath*, a journal then published by the College. His report appeared in the August number of 1901. The title of the article was, "Pulse Tracings," and was illustrated by three engravings showing the effect upon circulation of stimulation of the Vagus nerve. Dr. Tasker concluded his description of these experiments by the statement: "The character of the pulse shows a wonderful influence has been exerted on the heart."

The next recorded work which I have been able to find was done in the year 1905. In this year two valuable papers appeared. One was a partial report of experiments upon visceral reflexes. This paper was by Dr. Louisa Burns and was published in the *Osteopathic World*, of Minneapolis, in August, 1905. This report, although brief, was

indicative of the great amount of work which Dr. Burns was doing at that time. Her conclusions were founded upon experiments made upon about thirty cats and dogs. Among the conclusions reached were these:

"Mechanical stimulation in the lower dorsal region initiates peristalsis and vaso-constriction in the stomach and intestines, while deep, steady pressure in the same region relaxes the muscles both of the stomach and intestines and all their blood vessels."

"Stimulation of the Pneumogastric nerve initiates vaso constriction and peristalsis in stomach and small intestines."

"Gentle stimulation applied directly to the walls of the stomach and intestines produces normal peristalsis under normal conditions."

"After section of the Splanchnic nerves gentle stimulation of the walls of the stomach or intestines almost immediately produces the most violent peristalsis."

"After section of the Pneumogastric stimulation directly applied to these structures was followed, after a perceptible latent period, by the inhibition of any peristalsis already present, then by reverse peristalsis. Bile was sometimes found in the stomach after this experiment."

The same year that this report appeared Dr. J. J. Pierce, then of San Francisco, now of El Paso, Texas, read a paper before the meeting of the California State Association on some visceral actions obtained by manipulation of the Cerebo-spinal nerves. This paper was founded upon a series of careful experiments carried out by Dr. Pierce. His own statement is, "I have used various small animals—rabbits, cats and dogs—but mostly rabbits on account of the ease of handling. The operations are painless, the animals being anesthetized beforehand." Dr. Pierece especially emphasized the importance of his experiments from a practical standpoint. The value of these experiments as they appeal to him were as follows: First, "confidence that one may obtain definite action over certain nerves and centers by manual means; second, knowledge of the effect upon visceral action of irritative, destructive or inhibitive lesions upon the course of such nerves or centers as control the organ in question; third, a means of effectively demonstrating that osteopathic processes are scientific and can be proven."

As before stated, Dr. Pierce's paper was presented before the State Association of California. The National Association that year was held in Denver and at this meeting Dr. Carl McConnell delivered a stereopticon lecture illustrative of the original work which he was doing. It is probable that Dr. McConnell's photographs were the first ever made showing the effect of bony lesions upon the organs of the body. I regret that I cannot, at the present moment, place my hand on Dr. McConnell's report, but I well remember that those of us who listened to his masterly report felt that osteopathic principles were so thoroughly demonstrated by his work that we are not likely to lose faith at any time in the future. 1905 was certainly a great year for us.

The next matter of original research was on the question, "Which weighs the most, the egg or the chicken which comes from the egg?" The experimentation in this case was carried on by Dr. John O. Hunt, then a student in the Pacific College, and myself. The result was published in the bulletin of the Southern California Academy of Sciences in December, 1906. As a result of these experiments it was found that a sterile egg kept in the incubator by the side of a fertile egg lost 15½% of its weight. The chick hatched from the fertile egg weighed 29.65% less than the egg at the time of the beginning of incubation. In a second experiment the unfertilized egg lost 17% of its weight, while in an egg from which a chicken developed the loss was 20% of the original weight.

Since 1906 research work has been vigorously prosecuted. It is highly probable that previous to that time considerable research work had been done, but I have not found it reported in such periodicals as those to which I have had access.

C. A. WHITING, D. Sc., D. O.
PACIFIC COLLEGE OF OSTEOPATHY,
LOS ANGELES, CAL.

Osteopathy and Advertising

After considering the question for nearly two years, the Osteopathic Society of the City of New York, at a meeting held May 27th, 1911, placed itself on record, by a vote of more than two to one, as opposed to the sending out of literature "with card," or to using any name and address or other device which might be regarded as being the stigma of advertising on its literature.

The reason for this action was both practical and ethical, and as to the ethical ground there was some debate. If by circulating literature patients were brought to our offices and were cured, then the curing of these persons might be regarded as outweighing all other considerations. On the other hand, the circulating of literature "with card" places the matter of professional success within the range of commercial laws. The man who advertises most has the better chance—not the man whose work is best. It is, however, more important to cure than to

be ethical. There were other points of ethics in the debate.

But as to the practical side there was no real denial of the statement made by the older men, to the effect that the practice of sending out literature to non-patients not only failed to bring patients to the office, but in the long run did harm to the sender's standing in the community and was felt in his practice. The experience of the medical profession in this matter is beyond doubt a safe guide. The introduction of the commercial element weakens the hold of the profession as such, and in the long run re-acts to the detriment of every one in the profession. This is the ground for the action of the Society in interfering with what is regarded by some as a private right.

It may be that conditions in the City of New York are peculiar. If an inference can be drawn from the debate on this question as to the forces that brought new patients, it would be that the personal qualities of the physician, and the personal recommendations and conversations of patients were the effective factors. Literature beyond question does good; but only when backed up by this personal factor, and free from suspicion of the stigma of advertising. It is often the patients who are the hardest to cure, and hence are kept for a long time in contact with the physician, thus absorbing most of the osteopathic point of view and the osteopathic philosophy, who bring in most new patients.

In smaller towns it might be that literature plows up the field which can be later planted by the personal factor; that this literature might stir up conversation and controversy on the subject and be in the end effective; but it is the personal, not the literary influence, that tells.

On the other hand, the concensus of opinion is that the education of the public is a need and a great one. It may be contended that advertising is education and education is advertising. In a certain sense this is true; but the public makes a distinction. And so do you. In your own mind there is a great d fference between the physician who advertises, and the one who does not; between the one who hands you a booklet about the cure of disease, and you find his name and address are on the back, and the one who hands you this booklet in the interest of education with his name left off. With what different feelings you read it in the two cases! You are apt to be on guard against the one lest you be taken in by a clever advertiser using philanthropy as his bait. The other you will read with interest or even enthusiasm and will honor the man for his public-spirited effort. There is all the difference in the world here; in the one case the mind moves towards, in the other case it moves from, the subject-matter. Put the name and address on, and it becomes business advertising. Leave it off, and it is personal, educational, professional, public-spirited—and in neither case will you forget the individual—the mind tends always to be personal.

And yet the literature pays; the osteopathic profession is in a position where it undeniably needs literature, the best it can get, and needs it in quantities as great as it can possibly use. The profession as a whole has seen it in this light, and there are few that do not use the osteopathic propaganda literature.

These books, handed to patients or mailed to former patients, or sent by request, without card, but with personal influence, are very effective. Without the card, but with personal recommendation—since whenever without the card it is pretty sure to have this personal recommendation—the real effective factor is emphasized. Literature so sent abroad, and carefully kept out of the advertising class, is a very great asset.

Every osteopathic patient past or present should receive every month the best osteopathic literature published. Not one of them will forget the physician to whom he owes his cure, and no one of them will fail to recommend this physician in his talks. Our natural greed here is very apt to mislead us; to make us wish to get our own money's worth out of our books and to use this very faulty method of advertising, which loses more than it gains. If our literature has our name and address on it, the book will merely be handed over to a new enquirer, and left to do its own work. The giver will not try to impress nor will the recipient try to remember the physician's name, since he has it there in black and white. Thus the most valuable element is left out—and the black and white is quickly lost.

But the profession would miss the opportunity of the century if it failed to take advantage of the opportunity it has to educate its patients—not only those who are patrons now, but all those who ever have been patrons, or those who have given an excuse for the educating of them; and if it fails to keep in touch with them through its periodical literature, to carry them deeper and deeper into education, not only of osteopathy—not even primarily of osteopathy—but of the body and its sanitation, and of all things concerning health, and personal efficiency; or, if it fails to keep them in touch with the development of osteopathic charities and endowment funds, or if it fails to make its appeal to them for the students who will make the physicians of the future. Already its patrons have become

accustomed to the periodical literature, and many of them expect or even demand it. This literature should be as broad in scope as the purposes outlined here; and should not give its whole time to the discussion of things that osteopathy will cure. It should be sent only by the year, as other magazines.

If we could slightly change the character of our literature most of our patients would very gladly subscribe themselves, and renew the subscription indefinitely. Experience with advertising has proven that the best interests of the consumers is the best interest of the advertiser. Osteopathy should organize all of its patients and all of its friends and their families into a great body for education in matters touching the body and its health, and their own personal efficiency, and for other purposes which might arise.

There is need, also, for a more dignified form of literature than magazines. A little booklet by Dr. G. V. Webster, Carthage, N. Y., is both dignified and interesting. Drs. Matthews and Beeman of New York have placed at the disposal of the New York Society a booklet of their own composition which has been found very effective as an educator.

Whenever possible the State Societies should have public lectures on osteopathy. This work organized and looked on as a fight for intelligence, liberty, for the translation of the knowledge of the body into the people's English, would hold the public attention, and would pay for itself in a very short time.

E. E. TUCKER, D. O.

NEW YORK.

An Official Defination of Osteopathy?

The attention of the profession is called to the article in the September 3rd *British Medical Journal* wherein Dr. Bryce recognizes the merit of the osteopathic lesion, but critizes us severely as having a one idea system, and for confining ourselves to manipulation only. The Kirksville *Journal* very properly resents this criticism, declaring that osteopathy is much broader than Dr. Bryce conceives it to be, and asserts that Dr. Bryce missed the "real meat of the motto." To avoid such criticism in the future, I suggest that the American Osteopathic Association in Chicago formulate a proper definition of osteopathy, that may be used by us in refutation of all unjust criticisms such as were made by Dr. Bryce.

The Ontario Osteopathic Association has issued a pamphlet with a definition of osteopathy as published in the February, 1911, *Herald of Osteopathy* as follows: "Osteopathy is a complete system of healing wherein there are employed, First and Foremost, manipulations that normalize asseous relations, the tonicity of facia, ligaments and muscles. the flow of blood and lymph, the transmission of nerve force, and the functioning of bodily organs; and, Second, all other natural agencies in harmony with the body organism, such as dietetics, water, heat, cold, sunlight, air, exercise, psychic forces, in order to place a diseased body under such conditions as will enable nature to effect a cure; Third, conservative surgery that may be required when other agencies are of no avail." Perhaps such a definition would be a good one to adopt by the A. O. A. I would like to hear from the profession and receive any suggestions for improvement.

C. W. YOUNG, D. O.

State and Local Societies

CALIFORNIA

The press dispatches state that about three hundred practitioners attended the recent meeting of the California State Osteopathic Association held in Los Angeles June 1, 2 and 3. Mayor Alexander welcomed the visitors. Dr. D. C. Farnham, San Francisco, President of the organization, responded to the welcome and presided and many well-known practitioners appeared upon the program. Among the features as given by the local newspapers were the following: "Problems of the General Practitioner," Grace Shillings, Los Angeles; "Accidents to Labor," Lillian Whiting, South Pasadena; "Spinal Lesion in Relation to Acute Infections," L. E. Wycoff, Los Angeles; "The Functions of the Nervous System," Louisa Burns, Los Angeles.

Officers were elected as follows: President, L. L. Haight, Los Angeles; Vice-Presidents, Martha Barmby, Berkeley, and Ella Ferguson, Oakland; Secretary, Effie E. York, San Francisco; Treasurer, Lester R. Daniels, Sacramento; Trustees, J. L. Adams, Los Angeles, E. S. Merrill, Los Angeles, and D. C. Farnham, San Francisco.

A banquet was held at the close of the session at which Dr. Dain L. Tasker was toastmaster.

IOWA

The Iowa Osteopathic Association met in annual session at Des Moines May 25th. Among the papers and addresses, press dispatches give the following: "The Significance

of Osteopathic Factors in Gastro-intestinal Disturbances," G. W. Wendell, Still College; discussions by F. G. Cluett of Sioux City; "Experiences with Renal Calculi," A. W. Peterson, Hawarden. Dr. Clark M. Proctor, of Ames, conducted the round table discussion. President S. L. Taylor, of Still College, also addressed the meeting.

The Polk County Osteopathic Society banqueted the guests at the Chamberlain Hotel where Dr. Ella D. Still was toastmistress, following which the guests attended the closing exercises of Still College. Dr. George Still, of Kirksville, added much to the interest and value of the program.

Officers were elected for the following year: President, Della B. Caldwell, Des Moines; Vice-Presidents, A. E. Hook, Cherokee, H. H. Hitchcock, Vinton; Secretary, Carrie B. Collier, Clarinda; Treasurer, L. O. Thompson, Red Oak; Trustees, J. R. Bullard, Marshalltown, T. C. Stephenson, Cedar Falls, J. S. Baughman, Burlington, A. E. Hook, Cherokee.

The organization endorsed the new management of Still College; opposed the adoption of a National Health Department at Washington, and adopted a resolution commending the maintenance of the principles of osteopathy as announced by its founder, Dr. A. T. Still. The President, U. S. Parish, of Storm Lake, regretted that the political activities of the so-called "regulars" in going out of their way to oppose legislation which secured better services to the people of the State, had made it necessary for the osteopathic profession of the State to become active in legislation. He also scored the members of the profession who failed to cooperate with the majority of the members of the Society and thus held up important legislation at the last session. E. A. Hook called attention to the fact that osteopaths were denied the privilege of practice in any of the State hospitals.

GEORGIA

The Eighth Annual Convention of the Georgia Osteopathic Association was held in Savannah June 3rd and 4th. A. C. Layne, of Griffin, presided, having succeeded to the presidency through the untimely death of the President, J. W. Bennett, of Augusta. Officers for the ensuing year are: F. Muir Turner, Savannah, President; W. H. Bowdoin, Atlanta, Vice-President; Gussie M. Phillips, Atlanta, Secretary and Treasurer, and James Gorin, Savannah, Assistant Secretary and Treasurer. J. W. Elliott, of Cordele, was elected delegate to the American Osteopathic Association; and A. C. Layne, the retiring President, was elected a member of the Executive Committee The address of welcome was delivered by James Gorin of Savannah and was responded to by F. F. Jones of Macon. W. Banks Meacham, of Ashville, was the guests of honor, and gave an instructive address. Other papers were read by May Meta Lucas, Thomasville; C. E. Lorens, Columbus; Ida Ulmer, Atlanta; W. G. Waters, Athens, and others.

KANSAS

The Annual Meeting of the Kansas Osteopathic Association was held in Emporia May 19th and 20th. The organization passed a resolution urging that the 1912 meeting of the A. O. A. be held in Wichita. An interesting program was carried out which included an address by Dr. A. G. Hildreth, St. Louis, President of the A. O. A.

Officers were elected as follows: J. H. Bower, Selina, President; F. B. Waters, Wichita, Vice-President; G. B. Wolf, Ottawa, Secretary and Treasurer. The next annual session will be held in Wichita.

NEW ENGLAND

The Seventh Annual Meeting of the New England Osteopathic Association held at Worcester May 19th and 20th was most successful. The program as printed in previous issues was carried out and much very valuable discussion was drawn out by the several papers. A number of which will be presented in the next issue of the JOURNAL. Officers for the coming year are as follows: President, George W. Goode, Boston; Secretary, Eva G. Reid, Worcester; Treasurer, Clarence H. Wall, Providence; Vice-Presidents, George W. Reid, Worcester; Margaret B. Carleton, Keene; Sophronia T. Rosebrook, Portland, Me.

A proposition to change the name to the Northeastern Osteopathic Association is being considered, as very many New York, New Jersey and Pennsylvania practitioners attend the meetings, and it is desired to have membership open to them. The next meeting will be held in Boston.

NEW YORK

Drs. Clarke F. Fletcher, New York, President, and Grant E. Phillips, Schenectady, Secretary of the State Society, visited the Central New York Osteopathic Society at Syracuse on May 26th and aided in a most interesting and successful program. Two days later they met with the Rochester District Society, where another largely attended meeting was held. Practitioners were present from many of the western towns of the State.

NEW YORK CITY

The Annual Meeting of the Osteopathic Society for the City of New York was held

at the Waldorf Astoria Hotel, May 29th. Following this meeting the New York City papers gave much space to the proposition of the profession to establish a hotel in or about New York. The papers state that a gentleman has proposed to give one million dollars toward the founding of such an institution. A committee was appointed to look into the question of a site for the institution. Officers were elected as follows: President, Norman D. Mattison, Manhattan; Vice-President, Mae Murray Henney, Brooklyn; Secretary, Richard Wanless, Manhattan; Treasurer, C. R. Rogers, Manhattan; Historian, A. S. Henry, Queens; Keeper of Records, Elvire Tray, Yonkers; Directors, C. F. Bandel, Brooklyn; E. E. Tucker and Charles Hazzard, Manhattan.

At this meeting Dr. L. von H. Gerdine, of Kirksville, delivered a most instructive lecture on the "Diagnosis and Pathology of Certain Nervous Diseases." While in the East Dr. Gerdine appeared before the New England Society, the Boston Society and the Philadelphia Society in addition to the New York City meeting.

At the business session the question of the personal privilege, that is the right of members of the organization to send out literature with card of sender, was finally disposed of; and the proposed change, to allow members to send literature with card attached through the mails or hand to patients, was voted down by more than two to one vote. The question has been under consideration more or less for two years past.

NORTHERN OHIO

The Northern Ohio Osteopathic Society was organized May 30th at Toledo. Herbert Bernard, of Detroit, was the guest of honor and gave an address on "Mechanical Diagnosis."

Frank W. Long, Toledo, was elected President, and W. E. Reese, Toledo, Secretary and Treasurer. The Executive Committee consists of C. B. Currence, Tiffin; L. C. Sorensen and L. A. Liffiring of Toledo. Meetings will be held monthly in the Y. M. C. A. building of Toledo.

WESTERN PENNSYLVANIA

The Semi-annual Meeting of the Western Pennsylvania Osteopathic Society was held in Pittsburg May 20th. Ralph H. Williams, of Rochester, N. Y., was the guest of honor and principal speaker. His topic was "Mobilization and Pressure Bandage." Mae Van Doren, of Pittsburg, read a paper on "Antitoxine and Vaccines; H. H. Miller, of Washington, on "Ethics;" and William Rohacek, of Greensburg, on "Legislation." In the evening a banquet was held at which Drs. R. H. Williams, Rochester, N. Y., A. W. Vernon, Bradford, J. W. Robinson, Erie, Silas Dinsmoor, Pittsburg, and Lloyd Irwin, Washington, spoke. E. N. Hansen is President of the Society and acted as toastmaster at the dinner.

NORTHEASTERN PENNSYLVANIA

The regular monthly meeting of the organization was held with W. J. Perkins of Scranton on May 13th. "Malaria" was discussed by Margaret Evans, Wilkesbarre; "Cancer," W. J. Perkins, Scranton; and "Nasal Trouble" by Dr. McCollum of Dorranceton.

WASHINGTON

The Eastern Washington Association held their Second Annual Meeting in Spokane June 3rd. Officers were elected as follows: President, H. F. Morse, Wenatchee, Vice-President, Frank Holmes, Spokane; Secretary and Treasurer, H. E. Castor, Spokane.

WEST VIRGINIA

The Osteopathic Association of West Virginia held its annual meeting with Drs. Ely at Parkersburg June 10th.

PENNSYLVANIA

The program of the twelfth annual meeting of the Pennsylvania Osteopathic Association, which was held at the Hotel Walton, Philadelphia, June 9th and 10th, was substantially as printed in last month's JOURNAL.

The attendance was more than double that of any previous convention, and from first to last the interest was great.

One of the features was the talk given by Prof. Chas. H. LaWall, Department Chemist, and Harry P. Cassidy, Special Agent of the Food Commissioner of the State. The detection of impure, unfit and poisonous materials in foodstuffs and the punishment of the sophicators furnished the theme of a most instructive talk that was appreciated by all.

Dr. Chiles's address on "Problems Outside the Operating Room," and Dr. Teall's paper and demonstration on methods of conservation, were among the notable numbers. Ralph Kendrick Smith of Boston was another visitor whose address created much interest. A number of children, bared from waist up, were placed with their backs to the audience, and Dr. Smith had no difficulty in demonstrating his statement as to the prevalence of round shoulders, winged scapulae and various degrees of scoliosis. He makes the startling claim that 50% of all school children and 90% of all school girls have functional curvatures, many of which, unsuspected by parents and teachers, develop into incurable structional curves. He advocated thorough examination of children's spines instead of the perfunctory inspection as practiced in

many schools. He believes the osteopath best fitted to treat these cases.

A symposium on osteopathy as a system of therapeutics, and its adequacy in general practice, made a deep impression. "The Osteopath as a General Practitioner," by Warren A. Sherwood of Lancaster, was the first part of the symposium, and Dr. Clara E. Hough followed with a paper entitled, "Where Osteopathy Scores." The address of Joseph Ferguson of Brooklyn on "Emergencies" closed the series, and it would be hard to say which of the three was the most brilliant.

A project for the founding of an osteopathic hospital was introduced, and the president announced that in accordance with the desires indicated, he would appoint a committee of ten to confer with a like committee of the trustees and faculty of the Philadelphia College.

A. M. Smith, Hagerstown, demonstrated an arch support, invented by himself, which may be readily adjusted by means of set screws to the changes of the foot. E. M. Downing showed a little patient with a bad curvature to which he had adjusted a brace of his own design. Satisfactory progress seemed to have been made.

The social side was not forgotten. An hour on Friday evening with light refreshments and a general handshake, and a course luncheon during the noon intermission Saturday, participated in by more than a hundred, added variety to the serious business. Dr. Vastine acted as toastmaster at the luncheon, and toasts were responded to by Mr. Cassidy and Drs. Teall, Chiles, Heine, Couch, Morrow and Muttert.

All of the officers were re-elected: President, H. M. Vastine; Vice-President, C. W. McCurdy; Treasurer, E. M. Hansen; Secretary, E. M. Downing. The Executive Council consists of the above officers *ex officio* and three others. O. J. Snyder was re-elected, and Virgil A. Hook and Irving Whalley are new members.

E. M. DOWNING, D. O., *Secretary.*

Short News Notes

TESTING THE INDIANA LAW

The press dispatches tell of the arrest of A. W. Tindall, D. O., of Hartford City, Indiana, the complainant being a member of the State Board of Medical Examiners. It seems from the newspaper accounts that Tindall asked to be submitted to the regular examinations, but was refused this right by the State Board of Examiners. Upon being refused, he continued to practice and the arrest is the result. The case seems to hinge on the question of the amount of time, or the time distributed over a sufficient number of years, the law providing for at least six months in four separate years and Tindall having had nine months each in three separate years.

SCHOOL CLOSING

American School: One hundred and eighty-seven were graduated from this institution on June 2nd. According to the press reports nine of the graduates are from Canada, two from England, and the others divided among thirty-seven states. Illinois heads the list with twenty-one, Ohio follows with eighteen, Missouri, seventeen, New York, fourteen, etc.

Philadelphia College: Thirty new practitioners were graduated from the Philadelphia College of Osteopathy June 1st. The Philadelphia papers state that this is the largest graduating class in the history of the school. An unusual number of festivities were held in connection with the closing exercises.

Massachusetts College: The graduating exercises of the Massachusetts College were held in Lorimer Hall, Tremont Temple, Boston, June 9th. Twenty-four graduates received diplomas. The address was delivered by Dr. C. Hanford Henderson of New York, whose subject was, "Progress and the Physician."

DETROIT STRONG FOR THE 1912 MEETING

A dinner was recently given by the Detroit Osteopathic Society at which Dr. H. S. Bunting of Chicago was present. The object of the meeting was to perfect plans for securing the 1912 meeting for Detroit. Detroit expects to send a special car if not charter a train to take its loyal members to the Chicago Convention. Their Boost Committee is doing very active service.

NEW MEMBER OF BOARD IN MICHIGAN

T. L. Herroder, of Detroit, has been appointed by Governor Osborn a member of the State Board of Osteopathic Examination and Registration as a successor to Dr. E. F. Ashmore.

NEW MEMBER NORTH CAROLINIA BOARD

Dr. J. W. Blackmer, Wilmington, has been appointed a member of the Board of Osteopathic Examination and Registration for a term of five years.

OFF TO ATTEND THE CORONATION

Dr. Wilfred E. Harris, President of the Massachusetts College of Osteopathy, and his mother are in London to witness the coronation festivities. They will return in the early fall.

Dr. Ada A. Achorn, of Boston, is making a tour of Europe. She will be a guest of Dr. Georgiana Watson, of London, at the coronation exercises.

A SPLENDID PHOTOGRAVURE OF THE OLD DOCTOR

Gilbo & Co., 1920-22 Atlantic Ave., Brooklyn, N. Y., have made a most attractive photogravure of Dr. Still from what is considered the best likeness ever taken of him. Beneath is his facsimile signature and a small reproduction of the building in which osteopathy was first taught. This is arranged on beautiful paper 24x32 inches and makes a most attractive reception room engraving.

Gilbo and Co. have gone to great pains to make this work worthy of the high place the subject has in the hearts of the profession and they have thereby done a great service to the profession. Orders or inquiries to the engravers as above will receive prompt attention.

THE HEALING ART

Uremic poisoning, through faulty elimination, is just as serious a problem with the osteopath as it is with other physicians.

Many osteopaths are now using the natural Min-Ala waters from the town of Mineral Wells, Texas, with excellent results in the treatment of Rheumatism, Bright's Disease, Diabetes, Intestinal Atony and other manifestations of incomplete elimination.

The Min-Ala Water has wonderful solvent properties and has proven a great aid to osteopaths in their treatment of the above ailments.

DR. BASHAW WANTS BACK ISSUE OF JOURNAL

Dr. J. Pierce Bashaw, North East, Pa., asks the JOURNAL to state that he will pay one dollar for the issue of the JOURNAL of September, 1902, if delivered to him in good condition.

BORN

Born to Dr. and Mrs. R. T. Quick, Frederick, Okla., May 5th, 1911, Roy to Quick, Jr.

DIED

At his home in Watertown, S. D., April 24th, of Bright's Disease, Dr. G. P. Jones.

At the home of her parents, Erie, Pa., June 7th, of acute Lymphatic Lucemia, Sadie Lucile, age nine years, only daughter of Dr. and Mrs. B. W. Sweet.

Application for Membership

California

White, Lela B. (P), 14 Masonic Temple, Modesto.
Wimpress, Chas. H. (LA), Hanson House, Upland.

Connecticut

Crawford, S. Virginia (A), 10 Library Pl., Danbury.

Illinois

Doe, Albin Holmes (Mc), Deerpath Inn, Lake Forest.
Hassman, Geo. E. (A), 221 E. Ryder St., Litchfield.
Whipple, Alys D. (A), Rock Island.

Iowa

Gosden, Fannie (A), Farley.
Phillips, Beatrice (A), 1st Nat. Bank Bldg., Waterloo.
Phillips, Keene B. (A), 1st Nat. Bank Bldg., Waterloo.
Walker, Joseph Nelson (3), 102 S. Marshall St., Burlington.

Indiana

Seaman, Kent L. (SS), Shoaff Bldg., Ft. Wayne.

Kansas

Colteam, Ella D. (A), Lawrence.
Hook, H. C. (A), 100 First St., West, Hutchinson.
Koons, Wm. M. (A), Broadway and Walnut Sts., Herington.
Peterson, I. F. (SS), 619 Commercial St., Emporia.
Rolf, Harry G. (A), Pratt.
Shook, Ross O. S. (SC), Sterling.
Smith, Georgiana B. (A), 1419 Mansfield St. Winfield.
Waters, E. B. (A), Beacon Bldg., Wichita.

Kentucky

Bennett Thos. L. (A), 531 Bolivar St., Owensboro.

Massachusetts

Bolan, Lincoln R. (Mc), 34 Bow St., Somerville.
Clemens, C. Roy (LA), 200 S. Huntington Ave., Boston.
Emery, Mary (A), 52 Adams St., Boston.
Estey, Clarence W. (Mc), 30 Bank St., Attleboro.
Humphries, Ernest R., AB. (Mc) Forest and Sylvan Sts., Malden.
Nichols, Robt. H. (Mc), 15 Beacon St., Boston.
Ransden, Goodwin (Bn), Bridgewater, Mass.
Spaulding, Wm. R. (Bn), 738 Main St., Worcester.
Symonds, Mary Dean (Mc), 14 Greene St., Somerville, and 112 Cross St., Malden.
Williams, Maude G. (A), 78 Main St., Northampton.
Wright, Peter J. (Mc), 33 E. River St., Hyde Park.

Michigan

Hutchinson, Susan W. (Ac), Detroit. (Not located.)
Hutchinson, Wm. W. (Ac), Detroit. (Not located.)
Spaulding, Tom (A), Niles. (Not located.)

Mississippi

Cunningham, Rex E. (A), Brandon, Miss.

Missouri

Betzner, Hugh L. M. (A), Wellsville.
Cannon, P. J. (Ce), 3203A South Grand St., St. Louis.
Chase, Julia Jane (A), Kirksville. (Not located.)
Crum, J. W. (A), Kirksville. (Not located.)
Deeming, W. J. (A), Brookfield.
Edwards, James (A),Desoto.
Grow, Walter S. (A), Kirksville.
Leinbach, Sara J. (Ce), 3348 Michigan Ave., Kansas City.
Phillips, J. Marshall (A), Edina.
Swift, A. A. (A), Blackburn.
Vorhees, J. Martin, M. D. (A), Kirksville. (Not located.)

Montana

Spohr, C. B. (A), White Sulphur Springs.

Nebraska

Yoder, Gwynne H. (SS), Farmers Bank Bldg., Aurora.

New Jersey

Burnett, John Clawson (A), Summit.

New Mexico

Beckwith, Annette H. (A), 144 N. 3rd St., Raton.

New York

Schumacher, E. L. (A), 61 E. 66th St., New York City. (Not located.)

Wright, Lucy A. (At), 607 W. 137th St., New York City.

Oregon

Fasching, David J. (LA), Sheridan.

Oklahoma

Englehart, Frank A. (A), 127½ W. Main St., Oklahoma City.

South Dakota

Eneboe, T. P. (SC), N. Y. Blk., Sioux Falls.

Redfield, G. C. (SC), 101 Humphrey Blg., Parker.

Tennessee

O'Bryan, M. E. (A), Murfreesboro.

Texas

Carver, J. A. (SC), Suanah.

Lowry, Bell P. (A), 401 W. Knox St., Ennis.

Spiegle, Andrew A. (A), 290 Oak St., Palestine.

Vermont

Smith, Alexander H. (A), 80 Summer St., Barre.

Wisconsin

Caine, Allen B. (A), 915 Prairie Ave., Kenosha.

Risley, R. W. (LA), Washington Bl., Madison.

Washington, D. C.

Little, Clara Ulmer (A), 1717-T St., N. W.

CANADA

Alberta

Plummer, E. A. (LA), Red Deer.

Ontario

Dejardin, Charles H. (A), 418 Bloor St., W., Toronto.

Change of Addresses

Allen, L. W., from Springfield to 25 Davenport Bldg., Greenfield, Mass.

Alspach, Mary E., from Commerce Bldg. to 809-10 Mills Bldg., Topeka, Kan.

Arnott, Neil, from Boston, Mass., to 33-A Savile Row, London, Eng.

Baker, H. N., from Carlsbad to Loving, N. M.

Bell, H. R., from Ft. Atkinson to Berlin, Wis.

Bowers, H. D. and Alice, from Loma Linda, Cal., to Newberg, Ore.

Buckmaster, R. M., from Lexington to Elizabethtown, Ky.

Bumstead, L. A., from 104 Wheaton St. to Ky. C. S. Bldg., Delaware, O.

Burton, J. C., from 508 Frost Bldg. to 2935 Brooklyn Ave., Los Angeles, Cal.

Crist, R. H., from Frost Bldg. to 518 Ferguson Bldg., Los Angeles, Cal.

Greene, H. A., from Knoxville to Maryville, Tenn.

Greene, E. L., from Trude Bldg. to 1312 Lunt Ave., Chicago, Ill.

Gooch, Geo. J., from Owensboro, Ky., to Knoxville, Tenn.

Goodwin, P. H., from Los Angles to Glendora, Cal.

Gour, Andrew A., from 163 State St. to 525 Ashland Bouiv'd, Chicago, Ill.

Hulett, M. Iona, from Alamogordo to Cloudcroft, N. M.

Keller, F. B., from Elizabeth to 18 Beech St., Arlington, N. J.

Laslett, W. L., from 755 to 673 Boylston St., Boston, and from 12 Danville St. to 16 Hasting St., West Roxbury, Mass.

McAllister, B. F., from 216 W. Dixon St. to 225 North Block St., Fayetteville, Ark.

McIntyre, G. M., from 359 Main St. to Grosvenor Bldg., Kenosha, Wis.

Moore, Coyt, from Hammond to Raymond Bldg., Baton Rouge, La.

Moseley, J. R., from St. Augustine to 1615 Ohio St., Terre Haute, Ind.

Ross, Chas. E., from Opera House Blk. to 401 Merchants Nat. Bank Bldg., Fort Smith, Ark.

Scott, E. Agnes, from 1427 Stout St. to 512 Wyoming Bldg., Denver Colo.

Simons, Jas. C. and L. Verna, from 408 Fourth St. to 381 First St., Manistee, Mich.

Van Osdol, Oscar, from Loveland, Colo., to Junction City, Kas.

Westfall, D. C., from Findlay to The Munn Bldg., Coshocton, Ohio.

Wilson, G. S. Hodder, from Berlin to 55 Cork St., Guelph, Ont.

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